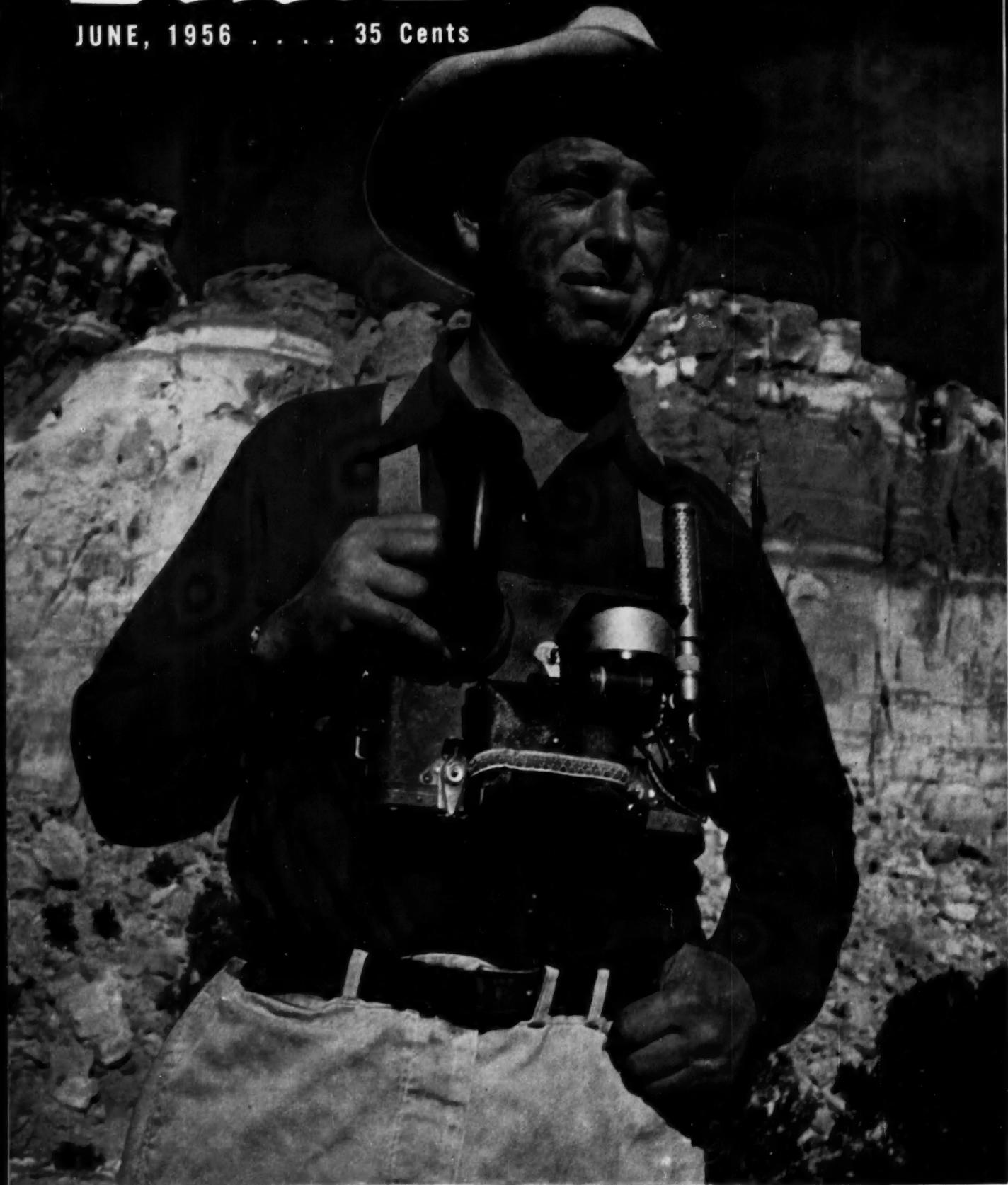


Desert

JUNE, 1956 . . . 35 Cents





DESERT NIGHT

By ELIZABETH LEE SARGENT
Ontario, California

Far removed from throbbering highways,
From the mad roar of rushing cars,
The desert offers solitude,
And quiet peace beneath the stars.

No man-made traps for weary feet,
Nor lurid scenes for tired eyes,
Only the silent solitude,
And peace beneath the tranquil skies.

TRYST

By IDA F. COMBEST
Denver, Colorado

I know cool nights on desert land,
With emerald stars and rising moon,
A broad expanse of sun-bleached sand
Where flowers pale in early June.

The burnish lusted sand I saw
And Joshua trees now bent with age
I drank the brimming cup of awe
And caught the myrrh-sweet breath of sage

A silent land on any night,
Wearing a robe of soft blue mist
With gleaming stars like candle light.
Within my heart I hold a tryst.

DESERT FUN

By MARIE NYEHOFF
Pico, California

It's fun to explore in the desert,
To prowl through the soft golden sand
It's fun to examine the flowers
That rear their bright heads from the land

It's exciting to hunt for the driftwood
And minerals and gemstones that hide
In the cascading shade of the canyons
Or that lurk in the shifting sand tide

It's a glory to drink at the chalice
Of the life giving amber gold sun
And to feel the swift wing
Of the air as it sings
It's a wonderful place to have fun!

SONG OF THE SPURS

By NINA O. LANSING
St. David, Arizona

A ranch woman knows
The song of the spurs
Buckled to booted feet;
The jingly, jangly, broadwinning spurs
With music in their beat

She hears them when
They accompany
A bawling calf at hand,
Bewailing the searing branding iron
Burn ng the owner's brand

She hears them, too,
They sing, they say
As horse and rider take off,
"Pound the leather and uncoil the twine,
Pile on the loop—and he's caught!"

But the brashest tune
Is the tune they play
With raking rowels that ring,
"Ride that bronc if you're able,
High—wide an' han'some—Zing, Zing!"

Oh jingly, jangly
Rollickin' spurs,
Ranch woman would have you retreat;
The day is so long when you're bucked too
long
To her cow-man's booted feet

To Greatness

By TANYA SOUTH

Unstable is our lot—unsure.
From day to day some new allure
Haunts us. And our endeavors fritter.
Change brings so many things to litter
The Pathway to the free and wide.
We lack a concentrated stride.
We lack a fullness in our soul.
All dedicated to some goal—
Some purpose, to unswerving press
Therein lies Greatness—and Success.

Prescription

By HELEN K. BURBANK
San Bernardino, California

Your home is just a desert shack
Far beyond the dripping fog
But your friends all think you envy
Them their villas in the smog

They shake their heads in wonder
And they cannot understand
What it is that keeps you happy
In the land of endless sand.

So just ask them for a visit
Get them up at break of day
And then wait for their reactions
To the desert's reveille.

Will their criticisms vanish?
Well, at least they'll be less vocal
And perhaps some day they will admit
You're not just a stupid yokel.

They've been touched by desert magic
And some day they'll understand
That the desert has a meaning
Far beyond the shifting sand.

THE WHIRLWIND

By MERLE A. BROWN
Piedmont, California

Such a lonesome little whirlwind
On the desert's vast expanse,
Pirouetting prettily
In her lovely lissome dance.

DESERT LOVE

By EVA L. BROWNE
Las Vegas, Nevada

I found my love in a lovely place
A meadow the flowers had left;
The trees and rivers had passed it by.
Deserted—forlorn—bereft.

There the wind came down from the Walapi,
A sword in each hand he came,
But he glanced away from love's glowing
cheek,
And melted his icy flame.

The dagger plant tipped his weapons with
light,
The cactus his barb had forsaken,
Mesquite and Joshua, spine bedight
For love, they had hidden their thorn

Men called it a desert whose charms were
few,
Desolate, barren of grace;
Men called it a desert, but oh, I knew
Love dwelt in a lovely place!

SILENT GUARDS

By FERN GREENWALD DAVIS
Long Beach, California

As shades of blue and purple
Bathe distant rugged peaks,
Twilight falls in silence—
Only nature speaks.

As sleep on wings of blackness
Smother the sunset's glow,
Those hills—like knights in armor—
Stand guarding the desert below.

BRIGHT SENTINEL

By NELL GRIFFITH WILSON
Kenwood, California

So rich its flame against the desert sky,
So clothed in glory like a throne on high.
It is as if
A thousand sunsets
Forever stamped their beauty
On the cliff.

DESERT CALENDAR

May 30-June 17—Southwest Architecture Exhibition, Museum of Northern Arizona, Flagstaff.

June 1—Lowell Observatory, Flagstaff, Arizona, opens evening sessions for public on alternate Fridays. Admission by tickets obtainable free of charge at Chamber of Commerce or at Observatory Library.

June 1-3—Kids' Rodeo, Otero County Fairgrounds, Alamogordo, N. M.

June 1-15—Second Annual Art Show, sponsored by Rodeo de Santa Fe, Museum of New Mexico Art Gallery, Santa Fe.

June 2—Park Lake Day and Fishing Derby, Santa Rosa, New Mexico.

June 2-3—Morongo Valley, California, Annual Spanish Fiesta at the Morongo Lodge.

June 3—Corpus Christi Sunday, Outdoor Religious Processions from St. Francis Cathedral and Cristo Rey Church, Santa Fe, New Mexico; and Guadalupe Church and Old Mission, Taos and Ranchos de Taos.

June 7-9—Murray, Utah, Rodeo.

June 9-10—Carson Valley Days, Minden, Nevada.

June 10—Tour to Grave of Eugene Manlove Rhodes, Alamogordo, New Mexico.

June 10—Procession of La Conquistadora from St. Francis Cathedral to Rosario Chapel, Santa Fe, New Mexico.

June 10-17—New Mexico Girls' State, Albuquerque.

June 11-16—Nevada Boys' State, Reno.

June 12—St. Anthony's Procession after Vespers, La Loma, Taos, New Mexico.

June 13—San Antonio Corn Dance, Taos Pueblo, New Mexico. Cordoba and various other northern New Mexico rural communities will celebrate Feast of San Antonio de Padua, Fiesta at Sandia; Dance at San Ildefonso.

June 15—Junior Rodeo, Globe, Ariz.

June 15-17—9th Annual New Mexico State Championship High School Rodeo, Santa Rosa, New Mexico.

June 16—Desert Catalpa Club Hospitality Day, Lenwood, Barstow, California.

June 16-17—Navajo Roundup, Window Rock, Arizona.

June 16-17—Kearny Entrada, Raton, New Mexico.

June 18-22—Nevada Girls' State, Reno.

June 20-23—Annual Strawberry Days, Pleasant Grove, Utah.

June 23-24—Lions Club All Indian Rodeo, Gallup, New Mexico.

June 24—Annual Fiesta and Ceremonial Dances, San Juan Pueblo, New Mexico. Corn Dances at Taos and Acoma Pueblos.

June 25-July 6—Southwest Writers' Workshop, Arizona State College, Flagstaff. Phyllis and Weldon Heald, directors.

June 27-30—Rodeo, Miniature Parade and Stock Parade, Lehi, Utah.

June 29-30—Vernal, Utah, Amateur Rodeo.

June 29-July 1—Rodeo, Elko, Nev.



Volume 19

JUNE, 1956

Number 6

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Charcoal kilns near the ghost town of Frisco, Utah.

CHARCOAL

The West's Forgotten Industry

"**E**UREKA, NEVADA, August 11, 1879 — Two thousand persons, banded together, and with arms in their possession, defied the civil authorities and refused to have any of their number arrested. They now hold forcible possession of many coal pits in this county. By force they have prevented, and are now preventing, the owners of charcoal from hauling it to their furnaces, and they threaten to destroy other property and burn the town. Arrests have been resisted by the rioters, who are well armed, and organized under the command of desperate leaders."

When Governor Kinkead read this message from Sheriff Kyle and County Commission Chairman B. J. Turner of Eureka, he immediately called into active service a force of state militia and ordered them to the stricken city.

Between 1860 and 1880, when countless boomcamps were producing silver, there came into being in the West a gigantic industry without the aid of which the fabulous era of the silver moguls would never have been realized. Even then little heralded and now virtually unknown, charcoal production was a powerful, lusty business. Here is the story of that wasteful venture which literally swept the West like a blazing forest fire.

By NELL MURBARGER
Photographs by the author

The Fish Creek War was on—and all over the price of charcoal.

The supplying of fuel to the boom camp smelters was big business in the

double decades between 1860 and 1880. It was an industry so profitable and powerful that in the space of comparatively few years it poured into the pockets of operators inestimable millions of dollars, and by its stranglehold on the smelter fires of the West, cast over the entire structure of Western mining a menacing pall and constant threat.

Reviled, greedy, troublesome, wasteful and corrupt—it still was the Grand Panjandrum industry of the West and when the smelter operators of Eureka united in slashing the price they would pay for a bushel of charcoal to 27½ cents instead of the 30 cents they had been paying, on the grounds that mining conditions no longer enabled them to pay the higher price, the trouble began.

The Charcoal Burners Association,

numbering several thousand men in Eureka alone, rejected the reduction, refused to permit further deliveries of charcoal to the plants, and, on August 11, forcibly took possession of the town.

When the well-armed militia arrived a lull in the fighting ensued until August 18 when a posse of nine men, headed by Deputy Sheriff J. B. Simpson, attacked a coal pit on Fish Creek, 30 miles south of Eureka, and in a one-sided battle killed five of the coal burners, seriously wounded six others and took several prisoners. None of the law men suffered damage except to their reputations—the posse being criticized rather freely for the tactics employed. The battle, nevertheless, had the effect of ending the war.

Charcoal burning was not an exalted calling. Except for the men in charge of operations, it was work that demanded neither skill nor exceptional intelligence, and those so employed were looked upon as the dregs of the Western labor barrel. Receiving less than half the wage paid to common mine laborers, the charcoal camp employee lived in crude hovels or dugouts, under bad conditions of sanitation and health; and in the towns where he squandered his weekly \$10 wage, he

was scorned by every man from the gamblers and saloon keepers who greedily seized his purse, to the muckers and mill-men whose very livelihoods depended upon his continued labors.

Sweeping over the West like a pestilence, leaving behind it tens of thousands of acres stripped of timber, the charcoal industry also left in its wake a black record of bloodshed, racial strife and corruption, as well as whole Indian tribes rendered hostile and threatened by starvation through ruthless destruction of the nut-pine groves which, for untold centuries, had provided their mainstay of life.

In these days of the electric furnace, capable of volatilizing any known substance, it is impossible to appreciate the important industrial role played by charcoal in the last 5000 years.

Following the custom established generations before in the Old World, the first charcoal produced commercially in the West was burned in pits—the beehive-type kilns being still undeveloped.

The pits were of various sizes. A large pit might hold as much as 100 cords of green wood, generally pinyon pine, juniper, mountain mahogany or quaking aspen. Ignited and allowed

to burn to a certain degree before being smothered with earth, the cargo of such a pit would smolder flamelessly for 15 to 20 days before finally burning itself out. One firing in a pit of this size would produce from 2500 to 3500 bushels of charcoal—the black porous residue of wood from which all organic matter has been burned, leaving only pure, or nearly pure, carbon. Fed into the smelter furnaces in admixture with the ore and certain fluxing materials, and re-ignited under forced draught, this charcoal-carbon burned without smoke and produced an intense white heat—much hotter than could be realized from any type of wood in which organic matter still was present.

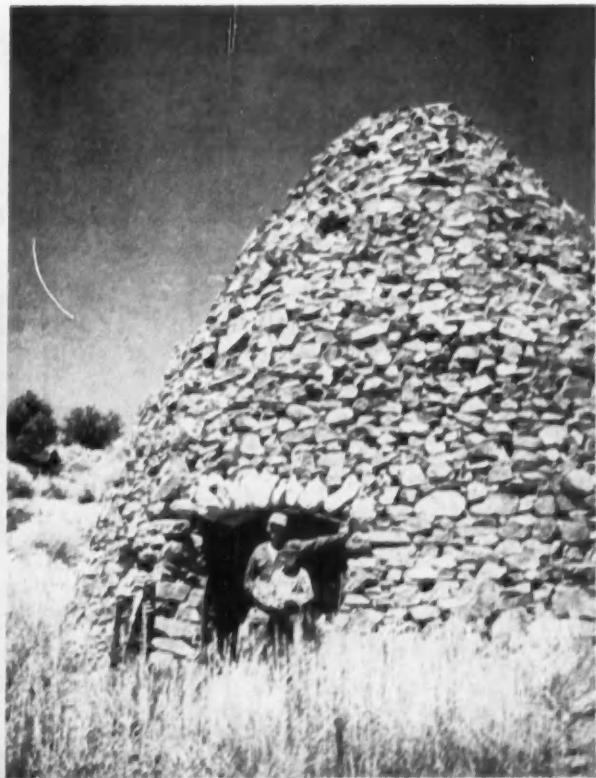
The practice of dealing in charcoal by the bushel unit prevailed throughout the West. A bushel of charcoal had a bulk of 1.59 cubic feet, and weighed from 16 to 20 pounds, depending on the species of wood used and quality of the finished product. One cord of green wood—four feet high, four feet wide and eight feet long—yielded by pit-burning, approximately 25 bushels of 'coal.'

Price was contingent upon several factors—quality, hauling distance between pit and smelter, and that most

Charcoal from this stone and brick kiln was used in Iron City, Utah, iron smelters.



Native stone kiln that once supplied charcoal to Tybo and Hot Springs, Nye County, Nevada.



basic of all criterions—supply and demand.

Lowest quoted price for charcoal I have found in thousands of old mining reports and cost records, is the eight-cents-a-bushel rate paid by Oregon Iron Works, near Portland, in 1867—a price that would have yielded only two dollars for cutting an entire cord of wood, processing it into charcoal, and delivering it to the plant!

Lead smelters at Oreana, Nevada, at that same time, were paying an exorbitant 65 cents a bushel for their charcoal. As importation of charcoal from better wooded areas became feasible through arrival of the railroad in 1868, Oreana's profiteering charcoal contractors found it necessary to slash their demands to 25 cents a bushel—about the average price paid throughout the West.

Even at 25 cents, charcoal represented the smelter's largest single item of expense. That outlay varied widely from one mine to another, and from year to year—the quantity of charcoal required being contingent upon refractoriness of the ore, quality of the coal and skill of the operator.

Lead-silver smelters at Eureka, Nevada, for example, ordinarily required about 30 bushels of charcoal to reduce one ton of ore; but during the conclud-

ing six weeks of 1872, Ruby Consolidated Co., at Eureka, used 59 bushels to each ton. For a three-month period in 1872, Bristol & Daggett Smelter at Bingham Canyon, Utah, also used 59 bushels to the ton; and Winnamuck Furnaces, in Utah, used charcoal to a value of \$24.45 for every ton of ore smelted—56 percent of the entire cost of their smelting operation.

During the balmier years of its operation the Eureka Consolidated Mining Company consumed charcoal at the average rate of 4600 bushels daily. Throughout the year the company maintained a stockpile of 120,000 bushels—only 30 days' supply—and the superintendent's report on September 30, 1872, lists the value of charcoal then on hand as \$150,665.92. Richmond Consolidated, also of Eureka, had 215,000 bushels of charcoal on hand—enough to supply their operation for 46 days. By 1874 this company also was using 4600 bushels daily, and during the 22 month period from March, 1873, to January, 1875, expended for charcoal the staggering sum of \$880,000. At their peak of production, the dozen furnaces at Eureka were purchasing \$600,000 worth of charcoal monthly!

With this same situation, in greater or lesser degree, prevailing throughout

the mining country, it may be imagined what was happening to the tree crop.

Silver and lead mines of the Southwest were situated in arid desert-type country having little or no merchantable timber and that was far more valuable for construction purposes and mine timbering than for charcoal.

The lash of the charcoal woodcutters, consequently, fell upon the small juniper and pinyon pine trees. Mature specimens may be no more than a dozen feet in height, with trunks a foot in diameter, and eight or 10 cords of wood to the acre is about the most they yield.

Thus, each filling of a single large charcoal pit required the total tree crop from 10 or 12 acres of land, and when such lands were set upon by the swinging axes of the woodcutters, their small brush-timber disappeared almost as fast as if swept by forest fire!

Evidence of the rapidity with which the Western desert hills were denuded is contained in two government reports.

In *Statistics of Mines and Mining in the States and Territories West of the Rocky Mountains*, Rossiter W. Raymond proclaimed in 1872: "The wood for 10 miles around Eureka has been used up in a little over a year—thus the question of fuel becomes, at once, a very important one."

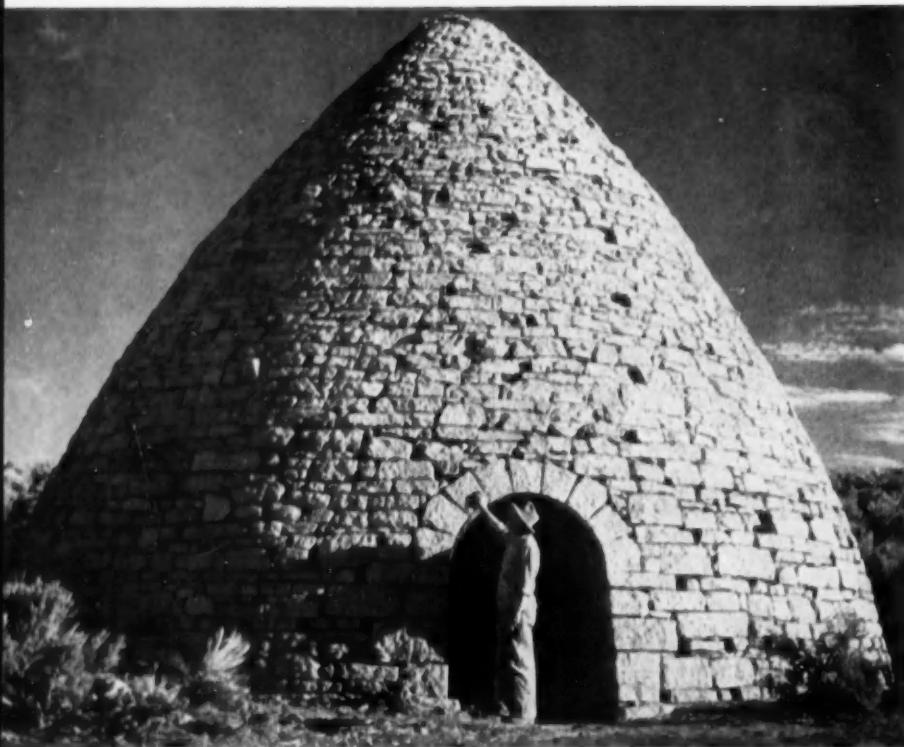
Three years later, the *Appendix to Journals of Senate and Assembly, 7th Session*, stated: "The timber in the vicinity of Eureka is fast disappearing. The coal burners have stripped the hills and mountains within a radius of 25 miles, so that the supply of fuel for smelting purposes is a very important one in making an estimate on the future mining prosperity of this county. Charcoal . . . must be obtained from some other source very soon, or the furnaces must be stopped . . . Should the charcoal rates advance within the next month or two, a crisis is imminent . . ."

The situation in some sections of the desert became so drastic woodcutters were seizing upon almost any vegetation available. At White Hills, Arizona, even the spongy Joshua tree was pressed into service, and silver smelters at Candelaria and Tuscarora, Nevada, were fed with charcoal burned from sagebrush. So slow and tedious was this operation that at one time more men were working in Tuscarora's charcoal camps than in all the mines and mills of that silver-rich district.

This growing shortage of fuel materials was responsible, in large measure, for a transition that began creeping into the charcoal industry about 1870.

Where, previously, all charcoal was burned in earthen pits, the new trend

Dr. F. G. Tagert of Austin, Nevada, examines the excellently-wrought masonry of one of the six charcoal kilns at Ward.





Burning Charcoal, Early Industries Case, Knox Hall of Civilization, Buffalo Museum of Science. Primitive manufacturing arose largely from accidental discovery. Modern industry is based upon scientific knowledge. Photo by C. E. Simmons.

was to beehive-type kilns, stoutly constructed of stone or brick. Offsetting the original cost of \$500 to \$1000 each, was the fact that such kilns could be used almost indefinitely, and by producing charcoal of a much higher quality and with less dross than was possible in pit-burning, the resultant saving in fuel material soon would repay the initial cost of construction.

I have encountered no authenticated record of beehive charcoal kilns being used in the West prior to 1872. In the summer of that year, according to Raymond's report published in 1873, Sultana Smelting Works, in American Fork Canyon, Utah, had in operation 12 kilns, with three more soon to be built.

"They have the shape of an old fashioned bee hive," wrote Raymond. "A diameter of 23 feet at the base, and a height of 20 feet. There is a charge door near the top in the back side, and a discharging door in front, level with the ground. A kiln holds 25 cords of wood, and the time for burning is 12 days; 38 to 48 bushels of good, solid charcoal are produced per cord of wood, or from 950 to 1200 bushels per day. Brands are returned

to a subsequent fire. The above yield, it is seen, is far higher than can be obtained in a common charcoal pit."

As effectiveness of the beehive kiln became apparent, they began sprouting in groups of three, five, 10; and everywhere built, they were at once a point of local interest. On September 2, 1877, the Eureka *Sentinel* reported:

"Henry Allen, the well-known contractor of Eureka, has just finished a work of considerable magnitude at Hot Creek. Last summer he was employed by Tybo Consolidated Co. to build 15 kilns in which the company proposed to burn the charcoal necessary to supply their furnaces at Tybo. He finished the work about a week ago, and some idea of its magnitude may be gathered from the fact that 600,000 bricks were used in building the kilns. They are oval in shape, having a diameter of 25 feet. Each one has a capacity of 1400 bushels, turning out that quantity of coal to each charge, the operation consuming five days. A great economy of time results from these kilns, instead of burning in the old-fashioned way, and as the company owns a vast quantity of wood in the immediate vicinity, they calculate

on their fuel costing them about one-half the usual rates. A force of 20 men were employed about three months in building the kilns."

If the kilns were superior to the pit-method of burning, it was, indeed, a fortuitous circumstance, for the situation in many parts of the mining country was becoming drastic. A squeeze play had developed, with the mills and smelters in the middle. As surface ores were depleted and the mines deepened, production became more costly; and as exhaustion of timber resources forced upon the charcoal contractors an ever-lengthening haul, the price demanded for charcoal crept slowly but steadily upward. This situation lead directly to the Fish Creek war.

Another charcoal war, marked by less bloodshed and more humor, followed the importation of Chinese coolie woodcutters to a charcoal camp near Tybo, Nevada.

Because they would work more cheaply, Chinese laborers, in most mining camps of the Great Basin area, were about as welcome as the plague. Therefore, when charcoal burners with a contract to supply several million bushels of fuel to the Two-G Mining

Co., imported a large gang of coolies to perform the labor, white workmen united in protest.

Assembling on street corners and in saloons, small knots of muttering whites congregated in a roaring mob and stormed the sleeping charcoal

camp. To the tune of cracking bullwhips, pistol shots and drunken curses they sent the Orientals fleeing for their lives. Morning found the charcoal contractors scouting the nearby hills for their scattered woodcutters. Driven back to the kilns, virtually at gunpoint,

the still-jittery Celestials were ordered to resume work, and throughout that day discharged their duties under the combined threat and protection of loaded Winchesters.

Nightfall brought another conclave of miners bristling with guns and indignation. In deference to the armed guards, still vigilantly patrolling the charcoal camp and its environs, the original plan to "clean out the Chinks" lost some of its fire, and the contractors were given 24 hours in which to get rid of the Chinamen.

When end of this grace period found them still cutting wood under protection of the rifle-armed guards, another ultimatum was issued: Either the Chinese leave camp before another nightfall, or both they and their employers would be ridden out of town on rails.

White laborers, by this time, were so thoroughly aroused that wholesale bloodshed would have been inevitable had not the Chinese offered to leave peaceably in exchange for stage fare to Eureka, 100 miles distant, and passage money was supplied quickly by Tybo's Anti-Asiatic League.

Meanwhile the charcoal industry was eating itself out of the land. Smelters at Eureka, to cite only one mining center out of hundreds, were consuming 1,200,000 bushels of charcoal annually—the total tree crop from over 5000 acres of juniper-pinyon woodland—and the hills were completely denuded of wood in a 35-mile radius.

But whether the smelter operators liked it or not the handwriting was on the wall. The only answer was coke; and with retooling, experimentation and increased skill in both coking and smelting, the transition was gradually—but grudgingly—made.

As each smelter, in turn, discontinued the use of charcoal and converted to coke, erstwhile woodchoppers and charcoal burners drifted to other jobs, many of them to the coal fields of Utah and Wyoming. So the conversion, at last, was completed.

With the last charge of wood laid in the great stone ovens, and the last fire grown cold, the desert wind and brush moved in to erase the black scars of the charcoal camps, and Nature reclothed the land laid waste.

Many of the old beehive kilns are still standing. The best ovens I have seen are those near the old ghost town of Ward, Nevada, 18 miles south of Ely. Six in number, these kilns are larger than average—being 30 feet in height, with a floor diameter of 27 feet, and walls two feet in thickness at the base. Five of the 80-year-old ovens are preserved perfectly, the top of the sixth showing some deteriora-

Desert Quiz:

One of the goals of *Desert Magazine* is to give its readers a better acquaintance with the history, geography, minerals, botany, Indian lore and the recreational opportunities in the desert country. And probably no part of each monthly issue contributes more to this end than the monthly quiz. You can always learn something new from this page. Ten correct answers is very good for a tenderfoot. Those who answer 15 correctly are eligible to become honorary members of the fraternity of Desert Rats. When you average 18 or more you become a Sand Dune Sage. The answers are on page 42.

- 1—If you were equipping your car for desert roads where there is likely to be heavy sand, the least important item in your kit would be—
Water Jack Tire chains Shovel
- 2—After mining and processing, quicksilver is shipped in—Pigs Flasks Bags Kegs
- 3—Ruth, Nevada, is well known for its—Famous caves Prehistoric cliff dwellings Volcanic crater Open pit copper mining
- 4—Which one of the following words is not a synonym for the others—
Arroyo Wash Escarpment Wadi
- 5—The Colorado River tributary which Major Wm. Powell named the Dirty Devil is now known as—Fremont River Virgin San Juan Escalante
- 6—The Inter-Tribal Indian Ceremonial is held annually in August at—Gallup Albuquerque Santa Fe Window Rock
- 7—According to legend, those who drink of the waters of the Hassayampa River will—Live to a ripe old age Always have good luck Become bald-headed Never again tell the truth
- 8—Cochise was a famous—Apache Indian Yuma Navajo
Papago
- 9—Color of the Joshua Tree blossom is — Orange Creamy white Blue Lavender
- 10—On Highway 66 near Winslow, Arizona, the motorist crosses the—Bill Williams River Rio Grande Verde River Little Colorado River
- 11—Historically, the Jayhawkers are associated with—Trek across Death Valley Navigation of the Colorado River The Apache wars The Mormon migration to Utah
- 12—Charleston peak is located in—Arizona Nevada New Mexico Utah
- 13—Hardest of the following minerals is—Chalcedony Calcite
Obsidian Topaz
- 14—To reach Palm Canyon from Palm Springs, California, one travels—South West North East
- 15—The University of Arizona is located in—Phoenix Tempe
Tucson Prescott
- 16—The historically famous Hole-in-the-Rock crossing on the Colorado River was used by—The Escalante Expedition Mormon settlers California '49er gold seekers Kearny's Army of the West
- 17—Galleta is the common name of a desert — Grass Tree
Lizard Bird
- 18—Dr. H. H. Nininger is widely known in the scientific world as an authority on—Paleontology Cacti Meteorites Arid land farming
- 19—Rawhide is a ghost mining camp in—Nevada California
Arizona New Mexico
- 20—Telescope Peak is in the—Funeral Mountains San Francisco Mountains Panamint Mountains White Mountains



The use of coke by Southwest smelters ended the charcoal era. This Arizona Pioneers' Historical Society photograph shows a coke team between Bisbee and St. Davids in 1886.

tion. Built of random stone, square-faced to the exterior, with dressed stone forming the frames of the charge and discharge doors, the gracefully-arched stone roofs of these kilns—like those of most charcoal ovens—derive their sole support from the highly skillful manner in which their stones are fitted together.

I doubt if many stone masons of today possess the masterly technique necessary to erect such a structure, completely without mortar or structural steel reinforcing—yet these fine old kilns have been standing solidly since shortly after the Civil War, and for more than 60 years of that time have known virtually no maintenance or repair.

Most charcoal kilns in the West were built of native stone, but occasionally brick or brick-and-stone kilns are encountered.

At the ghost town of Iron City, Utah, second point west of the Mississippi River where native iron ore was smelted, stands a perfectly preserved kiln and the remains of two others, all built of random stone for the lower two-thirds, and brick for the upper third. Thirteen badly deteriorated charcoal kilns at Tennessee Pass, Colorado, were constructed entirely of brick; and two groups of kilns I have visited—at Gold Hill, Utah, and Cottonwood Canyon, Inyo County, California—were built of adobe.

All the many kilns I have examined follow the same basic pattern—beehive in form, with an interior floor diameter of 20 to 30 feet. Near the top of each kiln is a charge door for receiving wood, and at ground level a discharge door for removing the charcoal—both openings fitted, originally with heavy iron doors which closed

against an iron frame set into the stone doorway, thereby effecting a seal nearly airtight. All air necessary to control the burning process was supplied through a series of small vents built into the kiln wall.

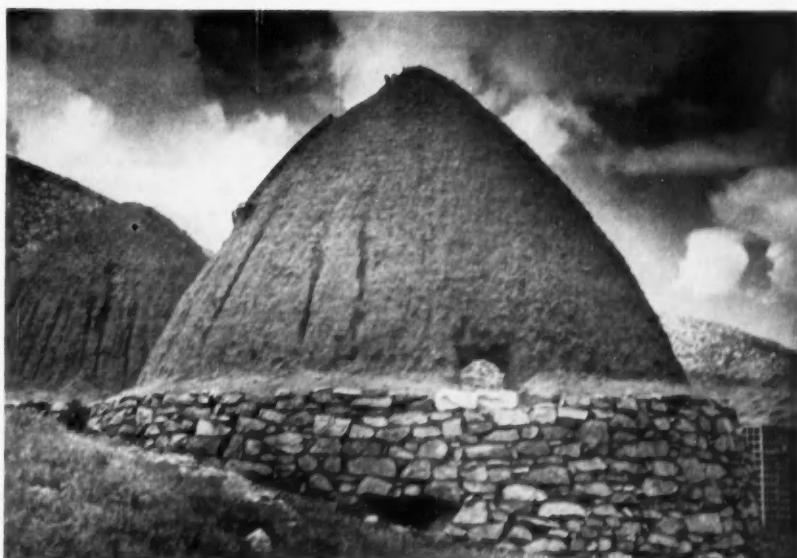
The yards around most of the old kilns are still scattered with fragments of jet-black charcoal, which is recognized as one of the most imperishable of all man-processed materials. A few kilns are known to have been abandoned with their last charge still intact. In a remote section of the Stone Cabin range, northeast of Tonopah, Nevada, several kilns which supplied the smelters at Tybo, were left packed with their final charge—charcoal as excellent in quality as any that may be

purchased today—and for more than 60 years, miners and ranchers in that vicinity have drawn upon this charcoal bank for fuel to fire the forges used in sharpening their tools and drill steel.

In other ways, as well, the kilns have been of use to man. All have been used as storm shelters by horses, cattle and sheep; and many have provided temporary havens for blizzard-threatened desert wayfarers.

But such uses, of course, are only transient and incidental. The real worth of the old charcoal ovens is their historical function in reminding present-day Americans of a now-vanished industry, without which the great silver and lead bonanzas of the early West could not have been harvested.

Rock and adobe kiln built at Gold Hill, Utah, 65 years ago.





Healthy, well-fed burro. Burros have cross marks on their backs (black line on spine and shoulder), said to date back to the day Jesus placed his hand on the burro that carried him to Jerusalem.

SEVERAL YEARS AGO during an exploration expedition into the badlands of the Coso Range of Southern California I saw my first herd of wild burros.

There were 40 or more animals in the group—jacks, jennies and youngsters of all sizes. They all looked healthy and well fed. They were wild but curious enough to let us get within camera range.

A few weeks later I was shocked when I read in a desert area newspaper that a number of the animals had been found shot. This report and subsequent accounts of wanton atrocities against the long-eared creatures prompted me to investigate the wild burro situation.

It was like poking down a hornet's nest with a short stick for no one on the desert is neutral when it comes to wild burros.

The battle lines are not clearly drawn, but the opposing opinions can be condensed into these views:

One faction feels that the burro helped make the West what it is today. In consideration of past services, the

burro is entitled to respect and protection.

Others hold the view that the burro in reverting to the wild, is taking the forage that properly belongs to the native wildlife of the region—the deer and the mountain sheep—and if there is not browse enough for both of them, the burro must be controlled. The fact that the burro is a canny little creature that can fend for itself better than some of the original natives, merely serves to aggravate this attitude.

Spanish explorers brought the first of these North Africa natives to the New World where they were used as pack animals.

Early Western prospectors discovered they could go just about anywhere with the burro. These solitary adventurers prowled every inch of the desert looking for mineral wealth. Some of those that made bonanza strikes gave full credit to their burro companions.

The California Fish and Game Department states that the wild burros roaming the Colorado and Mojave Deserts are descendants of animals left

Long-Eared Problem Child of the Desert

Should wild burros be rigidly protected or ruthlessly destroyed? There are plenty of arguments for and against both of these extreme points of view. Here is a current review of the controversy and of the burro—the problem child of the desert Southwest.

By RUSS LEADABRAND
Photographs by W. H. Ringe

behind by prospectors but those feral burros in northeastern California descend from sheepherders' animals. This latter breed, according to the Fish and Game experts, are bigger and huskier than their desert cousins.

Even as late as World War II burros were being released in the desert. In the middle 1940s a geological survey team working in the Saline Valley area of Inyo County abandoned a herd of burros there.

Today an estimated 2500 wild burros roam the California desert areas, and irregular checks by the Game Management branch of the Fish and Game Department indicate that the burro population is on the increase.

So rapidly is the wild burro herd gaining that both the Fish and Game people and representatives of the National Park Service have voiced concern over the possible effect the burgeoning burro population will have on the delicate balance of Nature.

The plight of the wild burro attracted considerable attention shortly after the war when the jeep opened up the desert.

Unfortunately some of these new desert explorers could not resist shooting at everything on the desert that moved. They used small caliber rifles, pistols and bows and arrows and their targets many times were the peaceful wild burros.

Desert residents began finding wounded, crippled and dead burros in increasing numbers throughout the back country.

Wild burros were not protected by law except that a sentence in the Fish and Game Code made it unlawful to

kill a burro if the meat was to be used for animal food.

Law enforcement officers found it impossible to apprehend the many back country butchers who killed and chopped up hundreds of the animals and sold the meat to Southern California fox and lion farms.

These repeated depredations attracted the attention of conservationists, animal lovers and doughy desert folks and they protested vigorously.

It was not until May 11, 1953, however, following an unfortunate and quickly repudiated news release by the Fish and Game Department advocating burro hunting—that the "Burro Bill," supported by senators Charles Brown of Shoshone and Jess R. Dorsay of Bakersfield, became a law.

This legislation, Section 1403 of the California Fish and Game Code, made it illegal to kill any undomesticated burro.

The conservationists were pleased with the bill except for a clause limiting it for only two years.

In spite of the 1953 law, reports of burro atrocities continued to come out of the desert country. Many of them originated in the Panamint Valley area of Inyo County.

These slaughters and a report of the poisoning of 60 burros near Randsburg aroused much public wrath.

At the height of public sentiment for the protection of the burro, news that the National Park Service was killing burros in Death Valley National Monument became public.

The National Park Service explained that the barren mountains of the National Monument are home to both the feral burro and the bighorn sheep. In a 1939 survey of the bighorn sheep population it was reported that there was considerable competition between the burro and sheep for water.

The wild burro is an uninvited guest to the desert, the Park Service decided, and it declared in favor of the sheep.

In a recent issue of *Pacific Discovery* the Park Service's feeling is summed up by former Death Valley National Monument naturalist L. Floyd Keller:

"Ten years ago there were 500 Nelson's bighorn sheep in the Death Valley region. Today there is perhaps only half that number. Ten years ago there were 1000 burros in the same area. Today, in spite of drastic measures to reduce their number, there are still 1000 burros in the area."

"Since the burros feed over the entire range and tend to crowd out other forms of animal life, they must be controlled before they gain exclusive possession of the park."

"The burros are thinned out by shooting. As to the extent of the program, if we obeyed the letter of the



In some parts of the Southwest, burros are still used to herd sheep.

law our duty would require us to eliminate every last burro in Death Valley National Monument.

"We have been unable to do so for two reasons, public sentiment and the fact that the burro population is always on the move, in and out of the Monument. Outside the Monument boundaries they are protected by the same laws that protect all wild creatures."

Death Valley National Monument Superintendent Fred W. Binnewies told me that he takes exception to the 1939 sheep survey report issued by the *California Fish and Game Magazine*.

He points out that a new, current bighorn survey in the National Monument has uncovered evidence that bighorn sheep and burros are equally guilty of fouling desert water holes. A 1952 report by the Arizona Fish and Game Commission strongly hints that burros have driven bighorn sheep away from certain mountain areas.

Binnewies reiterates, however, that the Park Service will favor the sheep if they have to make a choice between the two animals.

"If the burro population gets out of hand we will have to treat it the same as we would any other intruding species," Binnewies said.

"There are no burros in the mountains in the Funeral Range on the east side of Death Valley now. We want to try to keep it that way for there are a number of sheep in that region," he added.

Binnewies gave no indication that large scale slaughter of the burros is even being considered by the Park Service. He said the Service was engaged in a "wait and see" attitude toward the long-eared clan.

The finger of guilt for fouling waterholes is being pointed at the feral burro from several other sources.

Cattlemen insist that burros muddy

water so badly stock will not drink from such spots. They also complain that rampaging jacks have killed calves on the desert ranges.

Burro supporters strongly deny this, but the rugged jacks have reputations as fierce fighters. There are few adult male burros that do not show some evidence of fighting—a missing ear, scarred heads and shoulders or wounded flanks.

Game management officials in several Southwestern states report that bighorn sheep have been driven from their ranges because of the reckless way the burro treats the public waterholes.

Fred L. Jones, former assistant game biologist of the California Department of Fish and Game asserts that the burro places such heavy pressure on the range the desirable forage plants are killed.

"These forage plants are the ones that bighorn sheep, quail, chukar partridge and other birds and mammals depend upon for survival. In some cases, high burro populations have seriously depleted or completely destroyed the range, not only for other creatures but for themselves as well."

"There are areas in which burros are heavily utilizing creosote bush, a plant that is absolutely zero in value as forage. Nothing else is known to eat it, even as a starvation diet. Acceptance of it by burros reflects a very severely depleted range condition with the accompanying disappearance of native wildlife species."

"The situation at water holes is even more drastic," Jones pointed out.

"Burros completely devastate the surrounding area both by feeding and trampling. Birds require cover around water holes so that they can drink with protection from predators."

"In many areas burros have criss-



Many burros are used throughout the nation as saddle animals for children. Capture of wild burros for this purpose is prohibited without license.

crossed steep hillsides with their wide trails. These trails serve as avenues for the downhill movement of the soil. In the desert, soil is a scarce commodity. The density and character of the vegetation is linked directly with soil conditions.

"A serious aspect of any range depletion in desert areas is the extremely slow recovery rate of native vegetation, even under complete protection from the depleting agent. The recovery rate of this desert plant cover is so slow that even under favorable conditions, it may take more than a lifetime to return to a favorable vegetative picture," Jones concluded.

In the face of such evidence against the burro plus the continuing atrocities by week-end desert gunmen, the burro supporters last year suggested that a burro sanctuary be established somewhere in the California desert.

Senator Brown proposed Saline Valley, a vast desert area immediately west of Death Valley in Inyo County. Saline Valley has few roads of egress and is sparsely populated.

But there were obvious drawbacks to such a proposition.

In the first place the California burro population is well scattered—there are between 500 and 1000 in Death Valley National Monument. Most of these are in the Panamint Mountains. The Inyokern Naval Ordnance Test Range supports a burro population of about 500 animals. These live on the salt flats immediately south of the Coso Range and elsewhere in the Coso and Argus Ranges. The Chocolate Mountains Naval Gunnery Range has at least 500 wild burros. The remaining 500 to 1000 estimated California desert burros roam all though the back country.

It would be a near-impossible job to round them all up.

Could the Saline Valley area support such a burro herd if they could be placed there? Some say the growing

population would starve in the Saline Valley region in a matter of years and before they would starve the burros would wander back into Death Valley in search of food.

In the third place the Saline Valley region is being coveted by the Navy as an extension of its desert empire. It is not likely that the Navy would care to share the region with the state's entire burro population.

The suggested Panamint Mountain area as a sanctuary for the animals would be quickly vetoed by the National Park Service.

Thus it would seem that the wild burro is unloved and unwanted by everyone on the desert.

Which, of course, is not true for the wild burro, pesky as he is, represents a real and colorful page in the Southwest's history.

Hundreds of the animals have been

ARIZONA WITHOUT SEAPORT BECAUSE CONGRESS SKIMPED

The recent announcement by Arizona Governor McFarland of the creation of a quasi-official seaport authority to study the possibilities of bringing ocean-going vessels up the Colorado to Yuma has brought into focus developments of a hundred years ago which robbed the state of an outlet to the sea.

James Gadsden had been appointed by President Pierce as a special minister to Mexico for the purpose of buying land south of the Gila River. The U.S. needed room for wagon roads and a warm-weather railroad route to California. Following the Mexican War thousands of gold seekers going to California traveled the southern bank of the Gila, then Mexican territory.

On December 30, 1853, Gadsden completed three treaties with Mexico and returned to Washington to obtain

taken from the desert, tamed and made into admirable pets. This practice is prohibited now by the newest California burro law. Burros may be taken for pets only upon licensing by the state Department of Agriculture. Only 12 such permits can be issued each year by the state.

Conservationists have not relented in their attempts to improve the wild burro's lot. Men like W. H. Ringe of Flintridge, California, hammer away at law makers and beat the pro-burro drums in public.

Ringe feels that unscrupulous pet food canners are still using burro meat. He's trying to get legislative support for a bill that would make it mandatory for pet food canners to list burro meat whenever it is an ingredient.

Perhaps the most realistic summation of the wild burro problem was told me by Fred Jones, state biologist:

"The burro should be managed so as to insure its continued existence.

"In order to fit it smoothly and without conflict into the complicated network of interrelationships existing among our native species, a sound background of factual information should be used as the basis for management.

"Total protection is no more the answer than was non-controlled hunting.

"The burro is an exotic, true, but so are chukar partridges and ring-necked pheasants. The mere fact of being an alien does not disqualify one from becoming a valuable and desirable citizen.

"The burro is here to stay, and we welcome his presence as an interesting addition to the desert family."

ratification on one of these. The others would automatically be cancelled.

To the dismay of today's Arizonans, our congress on June 30, 1854, accepted the least desirable of the three options. It was the cheapest one. The U.S. purchased 45,535 square miles of territory south of the Gila for \$10 million.

For \$25,000,000, Mexico offered to sell all that land north of 30-degrees N. Latitude from the Rio Grande to the Gulf of California, including all of Baja California. This would have made the border a straight line 70 miles south of the present boundary at Nogales.

The other option was sale of land north of a line approximately 20 miles south of Nogales, and extending directly west to the Gulf of California. Total cost: \$15,000,000, or \$5,000,-000 more than was paid for the area purchased. — Bert Fireman in the *Phoenix Gazette*



Seventeen Palms...

HISTORIC DESERT WATERHOLES III

The Indians called the Borrego Badlands the "Devil's House"—and for good reason, for it was a country easy to enter but difficult to get out of—alive. Water in this scorched, eroded land is especially scarce which explains the value off-trail desert travelers have placed on the oasis of Seventeen Palms. Although some say the brown, bitter water is unfit for human consumption, there are others whose very lives were saved by it.

By WALTER FORD

THE LITTLE band of Mexican "wetbacks" aimlessly wandering in the heart of California's Borrego Badlands on that warm spring day were fast approaching the limit of their endurance. Their water supply had long since been consumed and the last watering place at Harper's Well was 13 miles behind.

Suddenly the oasis of Seventeen Palms came into view and as fast as their waning strength would permit, the exhausted travelers staggered to the pool beneath the palms and eased their tortured throats. Then one of the Mexicans wrote a note of thanks for their deliverance. From the missive which I found in a can near the spring, it was not difficult to visualize the dramatic scene that followed the sighting of the life-saving spring. The note, written in Spanish, read:

We thank God for this little waterhole. We were four companions who were dying of thirst, lost, and God directed us to this water. The 8th day of March, 1951.

The back-door entry to the agricultural areas of Southern California, via Harper's Well, Borrego Valley and Coyote Canyon, is preferred by many of the illegal entrants from below the border. Once when I was traveling in a jeep from Anza to Borrego Valley I met an Immigration Officer who told me that wetbacks seldom strayed as far easterly as Seventeen Palms. Their usual trail, he stated, was a more direct line to the old waterhole at Borrego Springs, thence up Coyote Creek to the more populated farming areas where there are opportunities for ob-

taining work and seemingly, less chance of being apprehended and returned to their native land.

If the group that left the note at Seventeen Palms had veered westward, thereby missing the oasis, their trek across the unfamiliar clay hills would undoubtedly have had a disastrous end-

ing. The network of gullies into which the hills have become worn and in which the traveler loses all sense of direction, could easily have become a death-trap for the thirst-weakened wanderers. J. Smeaton Chase, in his *California Desert Trails*, quotes an Indian acquaintance as describing that section of the Badlands as a "Devil's House," where a man can get in but never out, a description to which anyone who has viewed the area from a distant height will readily agree.

Seventeen Palms has long been a favorite camping place for desert prospectors and travelers. Henry Wilson, dean of the Lost Pegleg hunters, told me about visiting the oasis in 1900 and Chase gives an interesting account of

As long as the Seventeen Palms spring is kept clear, a good supply of water can be obtained from it. Unofficial "register" is found under the skirt of dead fronds of the tree on the right.



camping there in mid-summer, while collecting material for his book *California Desert Trails*. The faint Indian trails which converge upon the spring indicate that it sustained a large population long before the white man appeared. Some authorities believe the trails are 200 years old and if such estimates are anywhere near correct, they have withstood the effects of erosion remarkably well. From the air they look as if they could easily have been made within the last 20 years.

The quality of Seventeen Palms water has long been a debatable topic among the desert fraternity, the viewpoint depending mainly upon one's need for water at the time he was considering its suitability for drinking. Chase described the water as brown, bitter and nauseating, and stated that it would have been dangerous to drink unboiled. I camped at Seventeen Palms for several days with Henry Wilson, and he avoided using the water for drinking. Henry said he used the water many times in the past without ill effects, but so long as he had a supply of fresh water he preferred to use it.

In his Water Supply Paper 224, Walter C. Mendenhall said the water was fairly good when the spring was kept open, but it becomes bitter and bad by neglect and disuse. When the group of thirst weakened Mexicans stumbled on to Seventeen Palms, it is hardly likely that they voiced any complaints about the quality of the water.

In the spring of 1950 Joe Foster and I accompanied Wilson on one of his periodic searches for the Pegleg mine. After unsuccessfully following a number of clues in the Grave Wash area where Henry believes the mine exists, we moved up to Seventeen Palms. Around the campfire one evening Henry told us a story about a lost cache of gold in the hills around us and we decided to try to locate it the next day.

The story, told to Henry by the late Bill Schnake, a long-time resident of Borrego Valley, was as follows: One day while Bill was visiting "Seventeen" he met two young fellows from San Diego who were trying to locate two landmarks, which would guide them to a place where a plentiful supply of gold nuggets would be found. The embryonic gold hunters were rather cagey about the nature of the landmarks, but from their map Bill was able to spot them as a riven rock and a cinder cone. Bill never got around to looking for the landmarks but before he died he passed the information on to Henry.

The following morning we drove our jeep northward from Seventeen Palms into what is probably the most

rugged section of the Badland area—where the slopes of the Santa Rosa Mountains drop off into a maze of sandstone pinnacles and deep ravines before spreading out into the washes and clay hills of the open desert. After taking the jeep as far as it could go, we searched the rough terrain on foot but found nothing remotely resembling the clues Bill Schnake described to Henry.

Back in camp at Seventeen Palms that evening we decided that it was time to bring our desert adventure to a close and we made plans to return to our homes in the Los Angeles area the following day. Once back at our daily routines, it was easy to consider Schnake's story in a more proper perspective and place it in the category of "just another lost-mine yarn."

However, Joe Foster did not follow this line of reasoning for he was intrigued with the story and felt we had not made a thorough enough search for Schnake's clues. Joe headed back for the Seventeen Palms area, alone, and on the second day of his search found one of the clues, the riven rock. Returning to his jeep he slipped descending a sandstone waterway and lay bruised and stunned for a long while before he could continue on. Back in camp he was so lame and exhausted that the sun had barely settled behind the distant Volcan Mountains before he was in his sleeping bag. He slept fitfully that night and dreamed he was standing at the edge of the missing cinder cone, which was lined with dazzling golden nuggets. An old prospector stood near the cone and directed Joe to gaze upon the brilliant display. "Here is the gold you sought," he said, "but after seeing it, your sight will be lost forever."

Joe awoke from his dream and for some agonizing moments he was actually unable to see. An overcast sky made the night so black that he could not see his hand before his face. Joe began reviewing the events of the previous day, his accident and the several possible outcomes — and how foolhardy his one-man expedition had been. He started to check on the number of days he had been away from home and suddenly recalled that he had an important business appointment in Los Angeles on the following day. In less than half an hour he packed his gear and was heading down Arroya Salada for home.

Seventeen Palms has long been a favorite camping spot for the off-trail desert travelers who prefer the ultimate in isolation and solitude. If the unofficial register, a glass jar under a palm tree containing cards and slips of paper bearing visitors' names can be considered an accurate guide, the

average does not exceed 12 visitors a year. Although Seventeen Palms has been reached in standard two-wheel drive cars by experienced desert drivers, the trip should not be attempted by those unaccustomed to driving in sandy washes with other than a four-wheel drive vehicle.

And one should not travel into the area alone. Help is at least 12 miles away in any direction. Henry Wilson had the misfortune of having his car break down at Seventeen Palms and he had to walk the 12 miles to Ocotillo Wells for help. In spite of his 77 years Henry made the trip without mishap. For one less wise in the ways of the desert, such a trip might have had an entirely different ending. Normally, Seventeen Palms may be reached by way of Borrego Springs or the Truckhaven road, but it is well to make local inquiries before taking either route.

CANCER—CLOUDY SKIES CORRELATION DISCOVERED

A retired Yakima, Washington, surgeon believes virus infections may cause heart disease, arteriosclerosis, cancer and diabetes. Radiation from the sun, his theory holds, kills the viruses; therefore, death rates from these diseases are lower in areas where there is a lot of sunshine.

The theory was advanced by Dr. Joseph E. Bittner who has spent more than four years on research and statistical studies. Some forms of cancer in chickens, researchers have established, can be caused by a virus, but the cause of human cancer remains unanswered. Heart disease, diabetes and artery disease generally are regarded as degenerative diseases.

Dr. Bittner believes the single greatest avenue of virus entrance into the body is on raw, uncooked food products, especially vegetables.

Dr. Bittner studied the seasonal and geographical variations in heart-disease and cancer death rates, seeking an explanation of why, for example, the Columbia Basin death rate is substantially lower than the rest of Washington and why the death rate from heart disease is lower in summer than winter.

By charting the death rates by counties against the number of cloudy days in each county, Dr. Bittner found a very close correlation. Similar correlation was found on comparisons for counties in Arizona, and for the United States as a whole, by state.

On those statistics, he showed that the death rates from heart disease and cancer in any area studied are in direct proportion to the number of cloudy days.



Where logs of petrified wood are weathering out of the Chinle sandstone formation in Circle Cliffs.

Petrified Forests in Utah's Circle Cliffs

Millions of years ago the logs from some pre-historic forest were deposited, probably by currents or tides, in what is now known as the Circle Cliffs area of southern Utah. Today they have all turned to stone by the slow process of fossilization—and here is the story of a visit to the colorful land where they are found.

By RANDALL HENDERSON
Map by Norton Allen

FOR YEARS Lurt Knee had been telling me about the petrified wood to be found in a remote geological formation in southern Utah known as the Circle Cliffs.

"There are three distinct forests," he said. "Great logs lie around on the ground, many of them still intact just as they were deposited ages ago before the cell structure of the wood was replaced by minerals. You should come up and see them."

It was in response to this suggestion that Cyria and I visited Knee's Pleasant

Creek ranch bordering on the Capitol Reef National Monument last summer. We always welcome an opportunity to return to that colorful southern Utah country of multi-colored sandstone spires, cliffs and buttes fringed with pinyon and juniper.

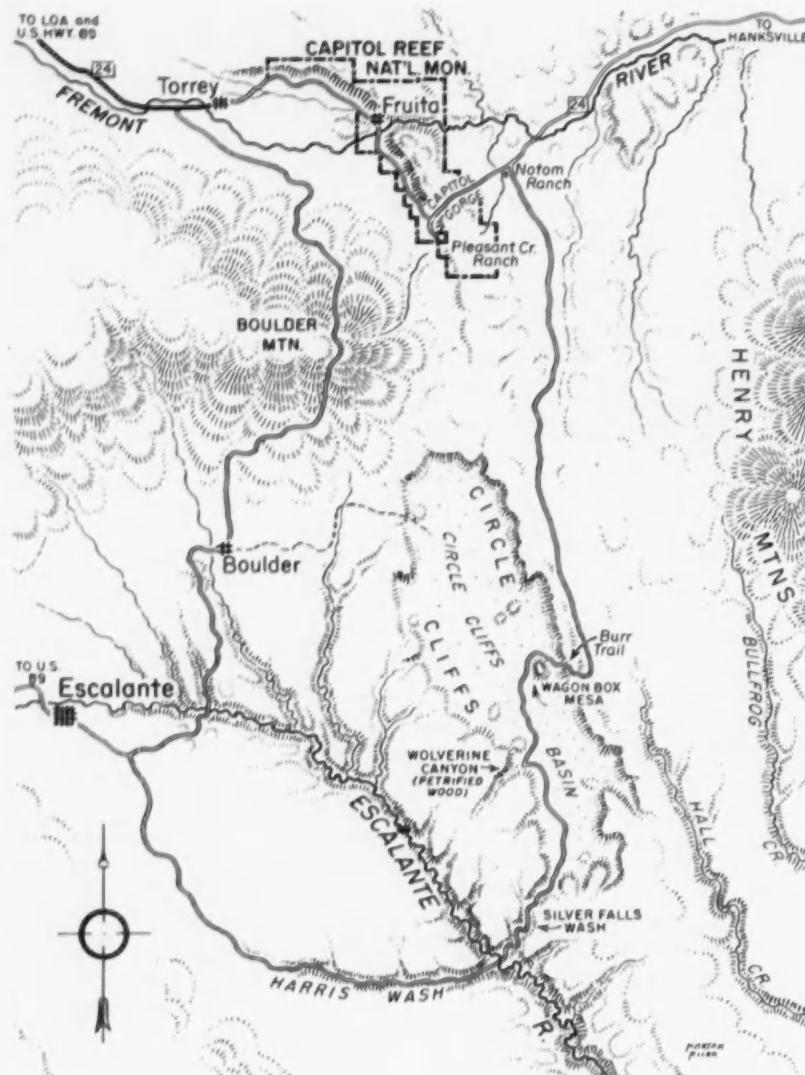
The Knees, Lurton and Margaret, had discovered a little mountain meadow along Pleasant Creek just outside the Capitol Reef Monument boundaries many years ago, and had built a comfortable cabin of rough hewn logs and native stone on a bluff

overlooking the creek. They have limited accommodations for guests, and Lurton guides station-wagon tours into the rugged desert wilderness of that region—to fishing creeks on Boulder Mountain, to Goblin Valley, Cathedral Valley and the Circle Cliffs.

We arrived there late in the afternoon just as the sun was dropping behind the great dome of Boulder Mountain to the west. Our travel had taken us over the well-graded road which follows the base of the red domes and turrets of the Capitol Reef escarpment, and we had stopped for a few moments at Fruita, Monument headquarters, to pay our respects to Charles Kelly, author and explorer who has contributed many interesting stories to Desert Magazine. Kelly is superintendent of the Monument.

As we sat by the huge stone fireplace that evening Lurt described a dozen interesting trips which might be made into the surrounding area, but always the conversation came back to Circle Cliffs, a great oval basin surrounded by an escarpment of red and cream sandstone. At one time almost inaccessible, the Cliffs area is now criss-crossed by the roads made by uranium prospectors.

Knee himself had staked out a promising claim within the Monument be-



fore it was closed to mine prospecting May 1, 1955. The Green Monster, Lurt calls his mining claim, and some ore has been shipped to the mill, although no rich strike has been made. We visited the mine the next day and I was given my first lesson in the identification of the ores which react to the Geiger Counter. Some of the uranite ores are black or gray, but carnotite is yellow and torbernite is green. Lurt's claim is of the latter—hence the name Green Monster.

In the days that followed we passed many prospecting and drilling outfits. The equipment generally consisted of a jeep or pickup truck with a drum of water and one or two drums of fuel oil. Invariably the greeting was: "Yu findin' anything?"

We left the ranch early one morning with Circle Cliffs as our destination. Our route was through the Capitol Gorge to the little settlement of Notom,

and thence across a glorious expanse of mesa often called the "painted desert." Lurt was our guide, and we were accompanied by two of his guests, Melvin and Eleanor Johnson of San Jose, California.

Eventually our route ascended a winding and newly graded gravel road known as the Burr Trail. This trail took us over the southern extension of Capitol Reef and into the great Circle Cliffs Basin. We were in a forest of juniper and pinyon, and only an experienced guide would have known which of the many prospector's roads would take us to our destination—the fossilized wood area.

Then we came to Horse Canyon which our guide had named the Black Forest of petrified wood. From there we continued on to Picturewood and Fallen Giant forests in Wolverine Canyon. "Canyon" and "forest" really are misnomers, for these petrified wood

drifts actually are weathering out of Chinle formation in coves of the Circle Cliffs escarpment—and the trees are the fossilized remains of forests which long ago toppled over and probably were submerged in mineral-bearing waters for millions of years while their cell structure slowly was being replaced by silica.

Most of the exposed logs are dark brown, gray or black. It is not spectacular in coloring, nor is it good cutting wood for the lapidaries, due to lack of brilliant coloring and to fracture. The petrified logs of the Circle Cliffs are there to be seen—not to be carried away. There is much material for rock collectors in the broad expanse of desert and mountains surrounding the Capitol Reef National Monument, but it is to be hoped that the great logs of the Circle Cliffs petrified forests will be left intact.

Some of the logs are fully exposed and others are weathering out of a 600-foot stratum of Chinle sandstone which lies below the Wingate formation of this area. Every uranium prospector who comes to Circle Cliffs sooner or later goes over the petrified wood areas with his Geiger Counter, because high grade uranite ore occasionally is found in petrified logs—but the Circle Cliffs fossilized wood gives no reaction.

Late in the afternoon we followed a winding road down Silver Falls creek to its junction with the Escalante River. The creekbed is dry most of the way but the canyon walls in many places are pocked with thousands of small erosion vugs, sometimes arranged in fantastic patterns.

We spread our sleeping bags that night on the grassy bank of the Escalante River, beneath great cottonwoods with dancing leaves. This was a memorable spot for Cyria and I, for it was here six years ago that with Harry Aleson, Georgia White and Chuck Lindsay we launched two 6-man rubber boats for the 70-mile voyage down the Escalante to its junction with the Colorado. The water was low but we thought that tributary streams coming in below would increase the flow. Less than a hundred yards downstream the boats grounded on a sandbar—and we spent the next six days wading the shallow stream and pulling boats that were scraping bottom much of the time. We survived the experience none the worse for the wear, but were glad our departure this time was to be in a station wagon rather than rubber boats.

Lounging around the campfire that evening I learned about our guide. Lurt told me he was born in Kanawha, Iowa, in 1910, and had moved with

his parents to Deer Creek, Colorado, when he was very young. His father had worked on the narrow gauge railroad from Durango to Silverton until he was killed in an accident. Then the family moved to Van Nuys, California, where Lurton completed high school.

He became interested in radio and electronics, and during the war was a trouble-shooter for the Department of Interior, setting up short wave stations at remote points in the Southwest.

Lurt is a brother of Mrs. Harry Goulding of the Monument Valley Trading post and he spent several months there with the Gouldings. He learned a little of the Navajo language. Also it was there that he met Margaret Tracy, a visitor from the East, and a few months later they were married. Lurt and Maggie, as she likes to be known, decided to seek a location of their own, where they could build a guest ranch or trading post as the Gouldings have done in Monument Valley.

One day, following a rocky trail down from the top of Boulder Moun-

The Toadstool — just one of the many weird rock formations found in the Circle Cliffs.



Above—Entering the Circle Cliffs area over the Burr Trail, one sees evidence of the intense search for uranium which has been going on in this area.

Below—The visitor leaving the Capitol Reef National Monument at the eastern entrance faces a drive of nearly 200 miles across one of the most desolate areas in the Southwest, before reaching the paved road again at Blanding. A standard car with good clearance can make this trip—but it is rough and rocky in places.

tain along Pleasant Creek they came to a little meadow along the creek—and this was the answer to their dreams, the Pleasant Creek ranch of today.

Lurt employed a Navajo Indian, Buster Whitehorse, to help build the cabin, and later a hogan to be used as a storehouse. Buster was an old-timer from the reservation—a longhair. He was willing to follow the white man's instructions in building a white man's house. But when it came to the hogan he knew how that should be built, and he wanted no help from a *Belikhahnah*, as the whites are known in Navajo.

Lurt wanted to put windows in the

hogan. Buster knew that wasn't the right way, but after some grumbling he consented. The crisis came when Lurt said they would have no smoke vent in the center of the roof.

"But how could the Great Spirit look down and see when one of the family was sick, if there was no hole in the roof?" Buster protested in Navajo. When Lurt refused to compromise, the Indian threw down his tools and went out in the field and began hoeing corn. He would have nothing to do with a hogan that violated the sacred traditions of his tribe.

Lurt finally went out in the field to make peace. "The Great Spirit could



Above—Pleasant Creek Ranch, the starting point for Lurt Knee's guided trips into the southern Utah wilderness area.

Below—"We camped one night on the grassy bank of the Escalante River under great cottonwoods with dancing leaves."

look in the window," he suggested. Buster grudgingly returned to work. But after the job was completed and the Indian had departed the Knees discovered that Buster had won the argument. Before he left he had poked a shovel handle through the dirt roof where the smoke vent should be.

From the Escalante River we followed an old road up Harris Wash toward the little farming town of Escalante. While not as massive as some of the other gorges in this region, Harris Wash is a colorful canyon — and really deserves a name more descriptive of its fantastic formations and coloring.

Our return trip to Pleasant Creek Ranch was the dirt and gravel road over Boulder Mountain—a road that is unpaved, but well graded most of

the way. On the mountain slope we stopped at the little community of Boulder where Mormon farmers with characteristic industry and thrift have created a little agricultural Shangri-la along Deer and Boulder creeks. These people with their milk cows and vegetable gardens would be well fed and healthy even if all the rest of the world went to pot. I am sure they have more freedom and genuine security than any group of people I know—but work hard for their independence, and they forego many of the frills and gadgets which Americans in more populous centers regard as necessities.

We ate lunch that June day in a snow storm 9000 feet up on Boulder Mountain, and then dropped down into the lovely valley which lies along the base of the Capitol reef where the

green of fields and orchards and pines and junipers are in lovely contrast to the red sandstone buttes that rise above.

Our home-bound trip from Pleasant Creek Ranch was over the long road via Hanksville to the Hite ferry on the Colorado and thence past the Natural Bridges National Monument to Blanding and Monument Valley. There is only one service station in a span of 90 miles, and the road is stony in places, but we never had to resort to our 4-wheel drive.

We'll go back to southern Utah again—it is a gorgeous country.

REFUGEES COULD USE GHOST TOWNS, GERMAN BELIEVES

Wolfgang von Boden, a German mattress stuffer, thinks it would be a good idea if some of the still-habitable Western ghost towns were turned over to homeless escapees from East Germany.

In a letter to Arizona's *Verde Independent*, von Boden asked: "What industry might be possible in Jerome? Is the ground good for agriculture? Could one raise, for instance, minks or chinchilla? Are there any marriageable young ladies in Jerome or nearby? Would there be by any chance, a mattress factory in your vicinity? . . .

" . . . With so many empty houses that must be falling in disrepair, could not your town benefit by having industrious people who would appreciate homes and land to cultivate?"

• • •

SCIENTIST CONVINCED HUGE METEOR VAPORIZED

Meteorologist Dr. H. H. Nininger of the National Meteorite Museum, Sedona, Arizona, is convinced that the biggest meteorite ever to strike the earth simply vaporized, except for a few fragments. This meteorite, which fell an estimated 50,000,000 years ago 20 miles southwest of Winslow, Arizona, is not buried deep in the ground, as everyone once assumed and many still believe, he declared.

Much effort has gone into drilling for the meteorite in the 4000-foot wide and 600-foot deep crater. Dr. Nininger is convinced that these attempts failed because the meteorite was turned to gas at the moment of impact. The gas recondensed as round or angular spheroids which can be found in the soil over an area of 100 square miles.

Scientists who have investigated Meteor Crater believe the aerial bomb that made it must have weighed from 100,000 to 500,000 tons and that it was traveling not less than nine miles a second.—*Los Angeles Times*

LIFE ON THE DESERT

One-Eyed Snake of Betatakin

This Navajo boy had a difficult decision to make—between the religious faith taught by his tribal ancestors, and his duty as a ranger in the National Park Service....

By LOLITA ALICE OLAINE

TWO YEARS ago we spent eight enchanted days camping near the ranger station above the cliff dwellings of Betatakin Ruins in northern Arizona. It was a delightful camping spot with enough large pinyon trees for shade, and plenty of good water available at the ranger station.

Each day we drove into Monument Valley or other interesting areas. We grew to like the rangers very much, especially the assistant ranger, a handsome young Navajo. We spent many hours with him, discussing his people, their habits, customs and religion. He was an extremely likable man, always greeting us with a wide grin and even when he was serious, there was a merry twinkle in his eye. His name, aptly enough, was Laughter.

When Laughter took us down the cliffs to visit the ruins of Betatakin, we asked about rattlesnakes. We were told that no snakes had ever been found at the campground or near the cliff dwellings, though they abounded in the surrounding lower country. Laughter then confided to us that the Navajos have reverence for thunder because it precedes rain in this parched country. Rattlesnakes are regarded as messengers of the gods, since the snakes always come out of the ground just before a thunder shower.

Rattlesnakes seldom venture forth in the heat of the day, but when the thunder-heads are gathering the ground is dark and shaded, and the snakes emerge from their holes. The Indians believe, however, that they come out to tell them that rain is on its way.

We were happy to know that there were no snakes near the campground for our sons enjoyed running about with the dog while I prepared the evening meal and my husband readied the camp for the night.

One evening, however, the dog discovered a rattle across the road, not 20 feet from camp. Laughter came by on his evening patrol a few minutes later and we asked him if we should destroy the snake.

"When we see a snake, we say to it, 'Do not fear brother, I will not hurt

you' so the snake does not hurt us," he said with a smile.

We told Laughter we would take a chance and try his method. We would tell the snake to stay out of our camp, and we would stay out of his. Laughter chuckled and went on his way.

But in a half hour he was back with

the head ranger who carried a long-handled shovel. Laughter was pale, but stood firmly by while his chief pried for the snake. We sensed the struggle Laughter had experienced with his conscience—a struggle that saw duty triumph over his tribal tradition.

The snake rattled furiously when he was uncovered, but refused to coil. The ranger probed him repeatedly, but the rattler still did not coil or strike.

Laughter stood back through all of this, looking more ill and frightened at every thrust of the shovel. We knew

Betatakin Cliff Dwelling ruins in Navajo National Monument, northern Arizona. Photo by Josef Muench.



he was praying "Lie still little brother so they won't harm you."

The snake was a huge old fellow. He must have been the grandfather of all snakes, and he bore a peculiar scar on his face. His blind left eye was

bluish white and across it was the jagged mark of an old injury.

But we were puzzled to know why the snake did not strike at the shovel. Could he hear Laughter whispering, "Lie still little brother, lie still"?

Continued Drouth Reduces River Runoff Predictions

Much below normal precipitation was recorded during March over most of the Southwest, resulting in a considerable reduction in the forecasts for water - year runoff for the major streams in the area.

Most of the Colorado River Basin received rainfall averaging slightly less than half of normal, and much above normal temperatures were reported during the latter part of March which caused some early season snow melt at high elevations. Streamflow is expected to be about 10 percent above average in the extreme headwaters of the Colorado and near average for the Roaring Fork and Taylor River basins. Near 75 percent of average runoff is in prospect for the Uncompahgre and lower Gunnison Basins. Flow of the Colorado River near Cisco, Utah, during the past six months has been 83 percent of the 1938-52 average and streamflow for the remainder of the water year is forecast to be 89 percent of the 15-year average.

The current watersupply outlook for the Green Basin in Wyoming is for above average runoff ranging from 112 percent to 126 percent. Streamflow for the Yampa and White Basins in Colorado is forecast to range from near average to 118 percent. Near 80 percent of average streamflow is forecast for the Duchesne River at Myton, Utah.

The San Juan River Basin forecasts have dropped 10 percent because of light March rainfall. The current outlook is for 78 percent of the 1938-52 average runoff for the San Juan at Rosa, New Mexico, near the headwater area, to 70 percent downstream at Farmington, New Mexico. Near 75 percent of average is expected for the northern tributaries.

The water supply outlook for the Little Colorado Basin is very poor; runoff is expected to be about 30 percent of the 1938-52 average.

Streamflows as low or lower than the record low flows experienced last

year are in prospect for the main Gila River. The April through June streamflow of the Tonto Creek and Verde River are also expected to be lower than last year. The water supply outlook for the Salt River near Roosevelt, Arizona, is the most favorable in the Gila Basin where the April through June runoff is expected to be 39 percent of the 15-year average, greater than last year's.

March was the second successive month of much below normal precipitation over the Rio Grande Basin, and the watersupply outlook has again been revised downward. Forecasts are: tributary drainage of the San Juan Mountains, 78 percent of average; tributaries draining the western slopes of the Sangre de Cristo range, 37 percent to 53 percent of average; middle Rio Grande valley at Otowi Bridge, 46 percent of average; inflow into Elephant Butte Reservoir, 34 percent of average.

March precipitation over the Great Salt Lake Basin was in many cases the lowest ever recorded. Over most of the basin, amounts ranged from only 5 percent to 10 percent of normal, although storms during the first three days of April have aided the water supply prospects.

Forecasts for the Bear and Logan Rivers are for water-year runoff near the 1938-52 average; Weber Basin, 109 percent of average at the South Fork of the Ogden River to 93 percent of average for the upper reaches of the Weber River; Sevier Basin, 47 percent to 61 percent of average; Beaver Basin, 63 percent of average; Humboldt River Basin, 150 percent of average for the main stream at Palisade, Nevada, and for the South Fork near Elko, Nevada; Martin Creek, 132 percent of average near Paradise Valley, Nevada; Truckee and Carson Rivers, 170 percent of average; West Walker River, 109 percent of average; East Walker River, 148 percent of average; Owens River, 100 percent of average; Mojave River Basin, 30 percent of average.

Finally the ranger said, "I might as well kill him and get it over with. I almost hate to do it—never saw a rattler that would not strike."

Laughter shuddered. He looked so striken that we immediately suggested the snake be taken down the mountain and released among the multitude. The Indian boy brightened at this suggestion and the ranger decided in favor of it, although he said it was against his better judgment.

They scooped the snake into an empty garbage can on the pickup truck and Laughter insisted on going along to see that it was released unharmed.

Next day the ranger told us that as soon as the snake was placed on the ground, Laughter complained of a stomach ache and asked for the rest of the day off. "I know he wanted to pray or have a sing or whatever they do, to ask forgiveness of that snake," the ranger said, "so I let him go."

We discussed the extremely dry summer the reservation was experiencing and other topics of interest that morning.

The following day we had a refreshing afternoon thundershower, and the day before we left it rained all day and night, with many exclamations from the Navajo god Thunder.

As we packed the car we reflected on our Navajoland adventure.

There were many unanswered questions that puzzled us. How did that ancient and grizzled old veteran of the sand dunes find its way up to the top of Betatakin? Why were there no other snakes on top of this granite dome—a habitat which snakes would welcome? How did our snake lose his eye? And where did all the rain come from so suddenly and unexpectedly?

Laughter has been thoroughly exposed to the Christian faith, both in school and in the service. His sister is a member of a Christian church in Tuba City and he himself told us that he saw much good in it. Still, the belief of his ancestors was strong and Laughter was proud of the fact that he was one of the youngest medicine men in his tribe.

There is a strange beauty enveloping Navajoland. Even in the Grand Canyon Country, where there are many tourists and conveniences, one feels a closeness to the beginning of all things. The mystery, the wonder and the power of God are all around you.

Laughter saw our God and his in the thunder and he felt God in the rain. Is it too much to believe that God rewarded Laughter for his devotion with a sloshing good thunder-shower?

Poisonous Desert Plants...

Not all desert plants are protected by thorns and spines — a few use a more subtle defense — poison. The ability to identify these plants is an easily-acquired talent and one that will prove valuable to desert travelers and especially to livestock owners.

By EDMUND C. JAEGER, D.Sc.
Curator of Plants
Riverside Municipal Museum

A FEW YEARS ago while in search of birds' nests, I was scouting the desert near the Southern Pacific railway tracks when I came to a dry wash and there found encamped a grizzled, bearded old man — a tie-walker dressed in rags. He greeted me with a cheery "hello" and we soon fell into conversation over the pail of deep brown beverage he was brewing over a small, fragrant fire of creosote twigs. "I've been right sick," he confided, "and I reckon this tea will surely make me well again. It's a kind I used to make for myself when I walked the ties in Minnesota."

One look at the plant being boiled made me a bit apprehensive. I knew that his "tea" was likely to make him even more ill than he already was, for the plant was California Croton (*Croton californica*), which contains a violent digestive扰。 Argue as I would, however, I could not persuade my new acquaintance that he was mistaken in the identity of this plant, which he took to be some harmless herb. "It's just like a weed we had in Minnesota that we all used to make medicine out of for all kinds of complaints," he insisted. "I've used it lots of times. Always got better right away."

After some moments of conversation about our respective travels, I gave him final warning not to drink his newly brewed tea, bade him goodbye, and was on my way leaving him still unpersuaded. I have often wondered what happened to that poor, misguided fellow. I fear he fared rather badly if he partook of that "tea," for the plant contains croton oil which even physicians administer only in very small doses, since its action is extremely violent. Croton is called El Barbasco by the Mexicans, a name which means



Some of the desert's poisonous plants: *Datura* or Jimson Weed, upper left; *Croton*, upper right; *Thamnosoma* or Desert Rhue, lower left; *Astragalus* or Locoweed, lower right. Sketch by Lloyd Mason Smith.

a poisonous herb used to narcotize fish.

The desert has many plants which are good to use as medicines, pot herbs, or as salad greens, but there are also a few species which definitely belong in the "never use" class. It is well to learn these few. Native Indians long have known these plants and from

them we have full knowledge of their toxicity.

One of the best known of the poisonous species is the Jimson weed (*Datura meteloides* and allied species). The several kinds of the widely distributed genus, *Datura*, are employed in many parts of the tropics and subtropics by natives to produce delirium.

Even our own desert Cahuillas once used a decoction of Datura roots in the initiation puberty rituals of adolescent youths and the induced dreams, usually described as being in brilliant color, were supposed to guide them in later life. This ceremony was called *toloache* and was rather widespread throughout the Southwest, but an overdose by the shaman could, and sometimes did, cause death. The custom is fortunately not sanctioned today, for the Datura contains both atropin, a narcotic which stimulates the sympathetic nervous system and depresses the cerebro-spinal nerves, and hyoscyamin, a hypnotic. All parts of the plant are to be avoided — the leaves, roots, stems and especially the seeds. A person with an overdose of Datura is said to die in violent convulsions.

The oleander (*Nerium odoratum*), a native of the dry Sahara, is so widely planted and grown in the Southwest that its poisonous nature should be made fully familiar to all desert dwellers. It contains a powerful cardiac poison. I well remember one summer long ago when some of the almost starved cattle of the Cahuilla Indians at Palm Springs ate some of the dry oleander leaves and twigs that had been thrown out on the village dump pile; within a matter of hours they were dead! Children have been made violently ill by innocently chewing this beautiful shrub's leaves and flowers.

Some of the native desert tobaccos, too, may be considered among poisonous plants. There are several species which when smoked almost "raise the roof off your head," their narcotic effects being much greater than the tobacco of commerce. The late Dr. Albert Setchell of the Department of Botany of the University of California, himself a great tobacco user, once gave me his word that having sampled in his pipe about every kind of wild tobacco known, he never found any satisfaction in them — "just too strong and foul-smelling for anyone but a tough-lunged fool."

Because it contains the poison selenium, a non-metallic element causing "alkali disease" in both cattle and man, one species of the handsome Prince's Plume (*Stanleya elata*) which is widespread in the Death Valley region, was once used by local Indians as food only after being boiled in several waters which were drained off to remove the poison. These Indians claimed that they always got sick if the boiled greens were consumed after only the first water was drained away. Similarly, many tribes in southern California removed the poisonous tannic

acid from otherwise very nutritious acorn meal by very similar procedure. The meal was placed in a crater of sand, and hot water percolated through it until all the acid was leached out. Oddly enough, in Mexico where there are many kinds of oaks, the natives never hit upon this idea of leaching out the tannic acid, and consequently a vast supply of available food was left untouched.

The Prince's Plume is not the only plant that contains selenium. Many species of *Astragalus* readily take-up the element if it is present in the soil in which they are growing, and yet the very same species may be perfectly harmless if growing in selenium-free soil. However, only laboratory analysis can determine which soil has the poison and which does not—the plants in either case appear identical. Commonly this plant is called Locoweed because it may produce "loco disease" in cattle that browse upon its foliage, causing them to go "loco" or crazy. No informed desert camper would ever risk adding the leaves of an *Astragalus* to his green salad or boiled stew.

Around the borders of dry lakes and in moist alkali flats near desert streams or lakes grows a rather ugly shrub commonly called "ink weed." Although its succulent leaves contain much tannic acid, which in small doses is supposed to cure diarrhea, I have witnessed instead violent cases of dysentery in my hungry burros which several times ate of this plant. It also is known to be toxic to sheep.

The juice of the native California poppy (*Eschscholtzia*), was long regarded by southwestern Indians as a poison and was used in the incantations of witch-doctors. A strong infusion of the plant was sometimes given as a love potion "to weaken the will of men and women and thus make them become easy prey to immoral persons." When such practices of witch-doctors came to the attention of the tribal chiefs, strong punishment and eventual banishment was usually the result.

Another plant widely distributed over the Southwestern deserts is the desert rhue (*Thamnosoma montana*), which has numerous yellowish glands on the surface of its leaves and green branches. These contain an oil which is very irritating to the skin and very dangerous if brought into contact with the eyes. The Indians used a tea of it as a counter-irritant to be applied in rheumatic conditions, but were very loathe to drink it, even in a weak brew, because of the violent stomach irritation and the hallucinations that fol-

lowed. When brushing past this rhue, one can detect a strong but pleasant odor in the foliage, an odor which belies the plant's dangerous potentiality.

Once in former days of ignorance of this plant's toxic character, I rubbed some *Thamnosoma* twigs between my fingers to better detect the pronounced odor. Later, because of an itching, I scratched the skin on the hollow of my knee with the nails of those same fingers. In an hour I was most uncomfortable with a pronounced burning pain and next day I was amazed to note that the skin at this site had entirely come off, leaving only raw flesh beneath. It was several days before I could walk with any degree of comfort. Needless to say, since then, I have consistently avoided coming into contact with the desert rhue.

In the great scheme of things I suppose poisons play the role of deterrent against certain plants being eaten, a means to them of survival, just as other desert species have profited by becoming thorny. Fortunately the list of desert plants to be avoided is a short one and the time taken to recognize these few will be well spent.

THE Desert MAGAZINE CLOSE-UPS

"One-Eyed Snake of Betatakin is my first attempt at writing and probably my last. I could have painted three pictures in the time it took me to type up that little story," wrote Lolita Alice Olaine of Palo Alto, California, whose first love, obviously, is painting.

Mrs. Olaine was a commercial artist for eight years before her marriage 22 years ago. Since then she has been busy raising two boys "and a lot of flowers." In between PTA, Cub Scout and Red Cross duties, she has found time to paint landscapes in oil and watercolor and flowers in watercolors. She is an active member of the Palo Alto Art Club and was Exhibition Director for it last year.

* * *

Jennella Robertson, who wrote this month's "We Use the Sun to Heat Our Water," has lived in Indian Wells Valley with her family since 1949. In that year they returned to California from a three-year stay in Oregon "before the webbing on our feet became too pronounced." Her husband, Allan, is employed at the Naval Ordnance Test Station.

HOME ON THE DESERT

Summer Garden Zinnias, Marigolds...

LAST SUMMER I went east for an extended visit, and learned that the easiest way to lose friends and alienate relatives is to keep telling them—during a record-breaking heat wave—how wonderful it is to live in the desert, even in summer. They merely looked at me strangely when their humid heat became unbearable and gasped, "Coming from the desert, you're used to heat like this of course."

They were surprised when I told them I was not. I told them I was used to being fairly comfortable in the dry heat of the desert; that evaporative cooling systems were quite effective and as common in desert homes as were furnaces in theirs.

Moreover I went on to mention how pleasant summer evenings are in the desert—how cool, how moonlit, how mosquito-less.

I told them how beautifully my desert garden grows. I attributed its success to an over abundance of sunshine. "After all," I said, "no amount of nutrients from soil and water can grow a plant without the sun's help." And

There is no denying it—summer days on the desert are hot. But new and improved varieties of zinnias and marigolds thrive in the sun and when all other plants have long since dropped their blossoms and faded away, these hardy flowers add color and joy to the home on the desert throughout the summer months.

By RUTH REYNOLDS

no telling to what length I might have dwelt on the desert's sun power had not my son-in-law, Charles, dryly observed that my desert sunshine must be wonderful—for making jerky. I assured him that it was and that there was no better basic diet than *carne secca*, although I myself had never tried any.

Pygmy Primrose Dwarf Double French Marigold, a new creation from the Burpee's Floradale Farms. Plants are compact growers, six-inches high and spread about one-foot across.

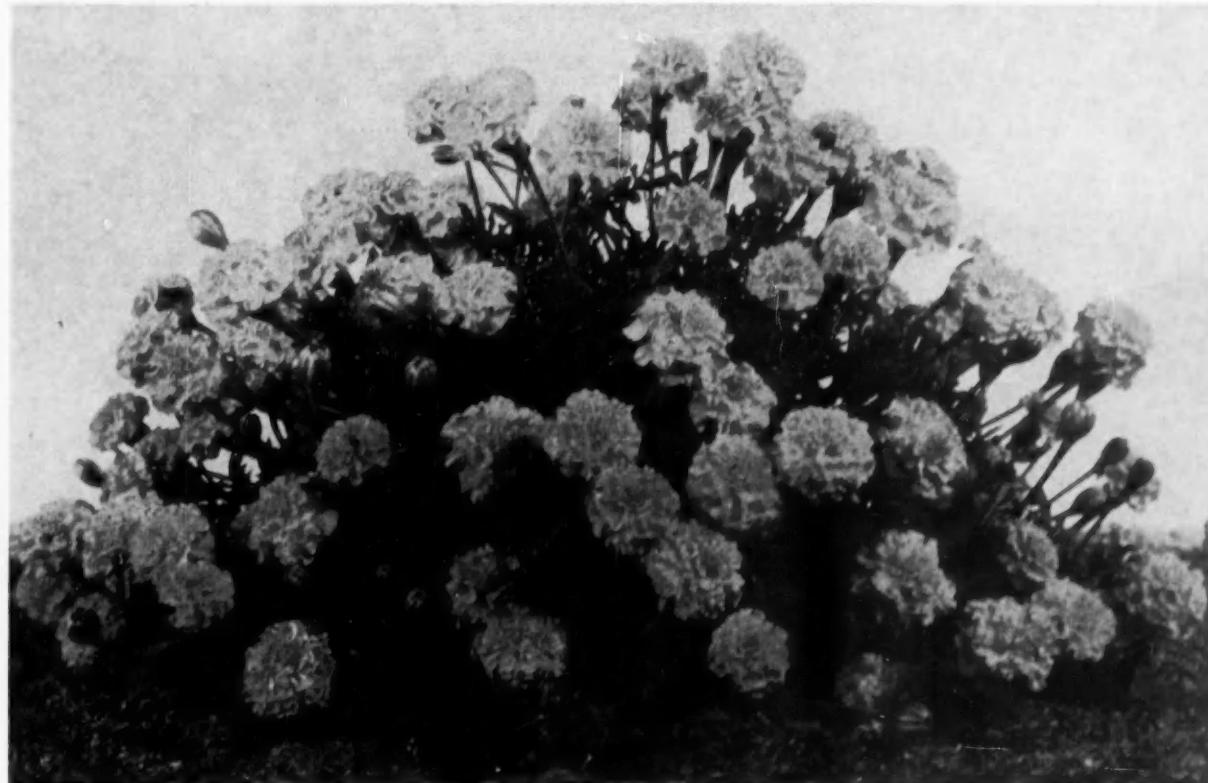
With that I withdrew from the feud and we enjoyed a friendly truce.

Now, confronted with June, the prospect of a summer at home, and a return visit of that eastern branch of the family, I may as well face the facts. The desert does get hot—very, very hot. The sun is inclined to over-shine a little and the garden could easily burn up—and the gardener-housewife-cook has problems.

"There's nothing to it," Ted tells me. All I have to do, he says, is to help him keep the lawn green and free of crabgrass, make the vegetables thrive, make the flowers bloom and practice drying meat.

My idea of helping my husband with his lawn problem is to order fertilizer—nitrogen high ammonium sulphate—insuring a vigorous growth of bermuda to crowd out the crabgrass and weeds.

Also it might be well to keep a look out for a sure and easy herbicide to use. In a spring issue of *Progressive Agriculture in Arizona*, published by the College of Agriculture of the university, an article by Keith C. Hamil-



ton and H. F. Arle is headed, "Promising new chemicals control crabgrass in bermuda grass lawns."

But the conclusion of the writers is that, "while the results of experiments are most promising, there is not sufficient experience at this time to recommend widespread usage of the herbicides." The two herbicides referred to are available, they say, under the trade names Karmex W and Karmex D. "Their use should be attempted only by persons familiar with the precision application equipment that must be used." So, while this news is only promising, it appears that science is on the verge of solving the crabgrass problem.

For the vegetable garden, the only timely trick I know is the use of a hormone spray for tomatoes. There may be many similar products but the one I use is called Tomatoset. You spray the plants only once, when they are in blossom, or you can use it on blossoms as they appear if you keep it confined to them only. I tried it last year and fewer blossoms fell off, more fruit set on and quality was improved.

When it comes to making the flowers bloom, the sun can be a big help—in some cases at least. My Texas Ranger and Crape Myrtle especially ask for little more than to have the overshadowing oleanders to the east and west of them trimmed back so they may get their full share of sunshine. No shade and no nitrogen high fertilizer for them or they run to foliage. Full sun and scant, occasional feedings of a complete fertilizer produce more bloom.

This year there are on the market improved organic type fertilizers with "chelated iron and minor trace elements" recommended for alkaline-calcareous soils. All organic fertilizers have some delayed action—last longer—and build up the soil.

Roses, never at their best in summer, should be mulched heavily and sprayed frequently for both insects and fungi. For, while I never see aphids when the sun is at summer heat, I do see thrips. And mildew is always possible and does appear in the desert rose garden. Black spot seldom does.

The real standbys of the summer garden are zinnias and, for later bloom, marigolds. Both may still be planted and there are, besides the older favorites, exciting 1956 innovations of both flowers.

A creeping zinnia with small, dainty flowers is ideal for low borders or planters. There is the giant zinnia Kismet, developed by the W. Atlee Burpee Seed Company. Even its color, a brilliant Persian red, is entirely new

to zinnias. Its blooms are fully double, 5 inches across, with informally quilled petals. The plant grows to 27 inches and is free blooming.

The marigold is enjoying a period of great popularity and may soon attain a new distinction—whiteness—and win some lucky gardener \$10,000, a sum offered by the W. Atlee Burpee company for a "glistening white" marigold, the prize going to the first person submitting seed which when grown at their Floradale farms in Lompoc, California, produces a qualifying flower.

The contest was launched in 1954 and from the 204 seed samples entered, no winning marigold was produced in 1955.

Sometimes, however, Nature comes up with a miracle in the form of a sport; that is, a plant whose flowers differ from others of its kind. From just such an event may come the white marigold. Perhaps even now the prize plant may be growing at the Floradale trial gardens, from seed received in 1955. But the offer is repeated in the 1956 Burpee seed catalog.

Among the nearest-to-white marigolds is Man-in-the-Moon developed by the Burpee staff. The palest so far, it is one in which the desired mutation might well occur. In the meantime it is a beauty in its own right. It has solid, round, carnation-like three to three and one-half inch blooms with broad, crisply ruffled, taffeta-like pale moon-yellow petals with lighter highlights. It is a vigorous African variety, growing to three feet. Other near-whites have chrysanthemum-like and peony-like flowers.

Burpee's staff has also created the new Orange Mum Marigold, the first giant chrysanthemum-flowered, tall African marigold with orange flowers. Its blooms are fluffy, ball-like and made up of numerous finely cut florets, intertwined in true mum form, four inches across and freely born on long, strong stems. Companion to the All American winner, Mammoth Mum of sulphur-yellow, it is a strong growing plant two and one-half feet tall.

New also is their Pygmy Primrose dwarf double French marigold. Six inches tall, with a 12-inch spread, it has double blooms one and one-half inches across, with pale primrose-yellow ruffled petals tinged at first with red near the base and slightly curled at the center. They are fine for bedding plants, borders and short-stemmed cut flowers.

Marigolds are not quite as sun loving as zinnias. They appreciate a little afternoon shade and a fairly fertile soil.

I probably cannot make mine bloom

before company arrives from the east—but I can make jerky as of now.

Modern cooking has gone primitive in this age of the charcoal brazier and what could be more colorfully southwestern or more delicious than *carne seca burros*?

Given a year to practice in, anybody can learn to make them. There's nothing to it. Just take a couple of good steaks—round or sirloin, cut medium thin, salt them well on both sides, cover with netting and hang them up to dry in the shade, preferably in a screened porch. The meat may be pinned, with clothespins, to a coat hanger. Let it dry for two days then broil it, eight minutes on each side. Now, substituting any clean stone or concrete surface for a *metate* and using a hammer or "hand stone," mash it between covers of clean cloth. Then, beginning at the edges, shred it by pulling it apart.

So much for dried meat. Now for the burros. Brown lightly one chopped onion and one minced garlic clove in oil—one-fourth cup to each pound of meat—add a small can of green chile peppers and the meat. Cook this mixture a few minutes then spoon servings of it onto large flower tortillas, folded once; fold over and roll into burros—individual servings.

Nothing to it? Well, hardly anything. Still I'm glad tortillas are easily available throughout the southwest. And I'm glad Charles likes to cook and I hope he takes to the "grinding stone" as exuberantly as to the charcoal burner. And I hope he "takes to" the home on the desert, reputed—by me—to be so comfortable, so moonlit, so mosquito-free, so all-around wonderful.

CHEAP DISTILLED SEA WATER FORECAST WITHIN 10 YEARS

Fresh water distilled from the ocean, cheap enough and in quantities for use for drinking, industry and irrigation, will be available within 10 years, predicts Dr. Everett D. Howe of the University of California. According to Dr. Howe, pilot studies, in one process being studied at the Richmond, California, field research station, indicate that fresh water can be produced from sea water for about \$100 an acre foot.

The cheapest of the several conversion methods being studied at the station is the "low temperature difference" distillation process in which warm sea water is evaporated at low pressure and passed through a turbine to produce power and become fresh water.

—Phoenix Gazette

INSCRIPTION HOUSE

By JOHN L. BLACKFORD

Cliff City Ruins

In deep, secluded, fertile-floored Nitsie Canyon, far within the massive sandstone formations of northern Arizona, the Ancient Ones built a cliff city, perching it high on a narrow shelf of the precipitous red walls. The date "1661," scratched on the side of a mud-plastered room, and found by early discoverers, is believed to have been carved by a Spanish military adventurer, and gives celebrated Inscription House its name.

Nitsie Canyon Cornfields

Today the Navajo plant fields of corn where once cliff dwellers harvested multi-colored maize. As the former were nomadic invaders from the north, they doubtless obtained their first seed during raids upon the agricultural pueblo peoples. Defending warriors of Inscription House kept watch over these fields where beans and squash were also raised. Theirs was an idyllic scene—long before the curtain of recorded history was lifted in the storied Southwest.



We Use the Sun to Heat Our Water

The Robertsons of Indian Wells Valley, California, were old-fashioned enough to build their own desert home and equip it with an antiquated windmill. And when it came to providing hot water, they borrowed from both the past and the future—they harnessed the sunshine which is so plentiful on the Mojave desert and built a very efficient solar heater.

By JENNELLA ROBERTSON

THE NATION'S press recently has given much attention to the harnessing of the sun's energy for man's use. Solar furnaces, solar heaters, solar water desalters—even solar-powered coolers and refrigerators will be the commonplace appliances of tomorrow. So, we reasoned, while planning our desert home in California's upper Mojave Desert, why not make a start at putting solar energy to use on our modest level?

We—my husband Allan, son Bob, 14, daughter Carroll, 8, and I—all had a hand in engineering and building our home and also the solar hot water heater which rests atop its roof on our 10-acre homesite on the brown, rolling

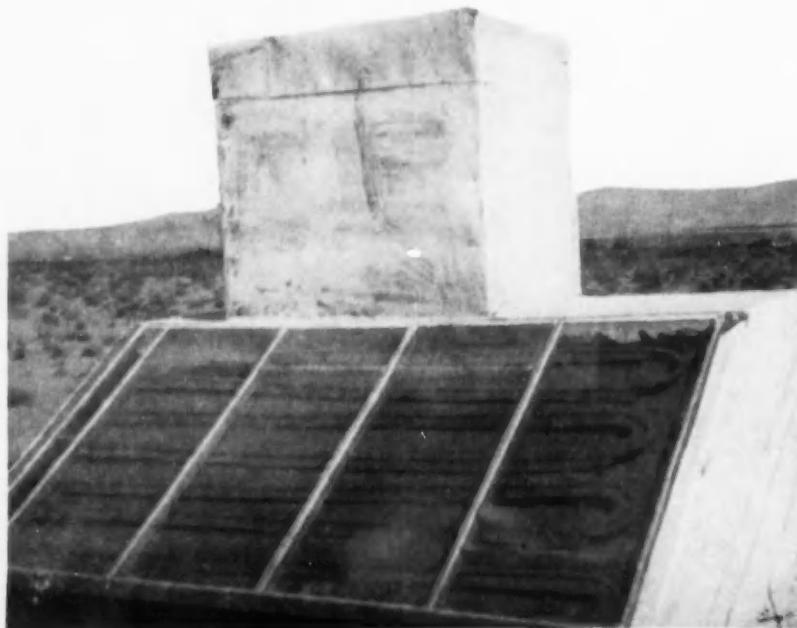
slopes of the rocky Radamacher Range overlooking Indian Wells Valley beneath the southern tip of the Sierras and the snow-topped crown of Mt. Whitney.

There was much work to do before we actually started on the house. We all pitched in to help Dad clear away brush and creosote bushes—leaving as many of the latter as possible, for with water these drab nondescript plants green out into handsome, heavily foliated, pungent bushes.

After the ground was cleared, we put up a utility shed for our tools and equipment and then moved our house-trailer to the site.

Hauling water for household use was a continuous and weary chore.

The Robertsons' solar hot water heater on the roof of their desert home.



So, first came the well. It just so happened that our lean-flanked purse and professional drillers did not have a common meeting ground.

"Nothing to it," said my husband. Years ago he had dug his own well in the Lucerne Valley by hand—all 20 feet of it. But he soon discovered, after six-feet of back-breaking digging on the new well, that this was going to be quite a different proposition.

So we looked around, keeping both eyes and ears open for a bargain, and found an old well-rig for sale. We bought it without a thought, lest we lose our golden opportunity. Naturally it needed repairing—welding and new parts and, of course, since the head of the house is handy at doing just about anything he sets his mind to, judicious additions soon had the rig in top running order.

The well was put down on weekends and after work on weekdays. We hit water at 146 feet but continued drilling to 175 feet to give our well a good standing depth.

As soon as the well was ready to pump, we decided to be old-fashioned—and practical. We looked around once more—this time for a windmill. A farmer in Lancaster had one for sale and because it was in excellent condition, we bought it.

We painted it brick-red, oiled the various moving parts and placed it atop a sturdy, 20-foot welded tower of heavy, three-inch steel pipe.

You have to live on the desert and haul every precious drop of water you use to be able to appreciate owning your own cool, free, flowing water.

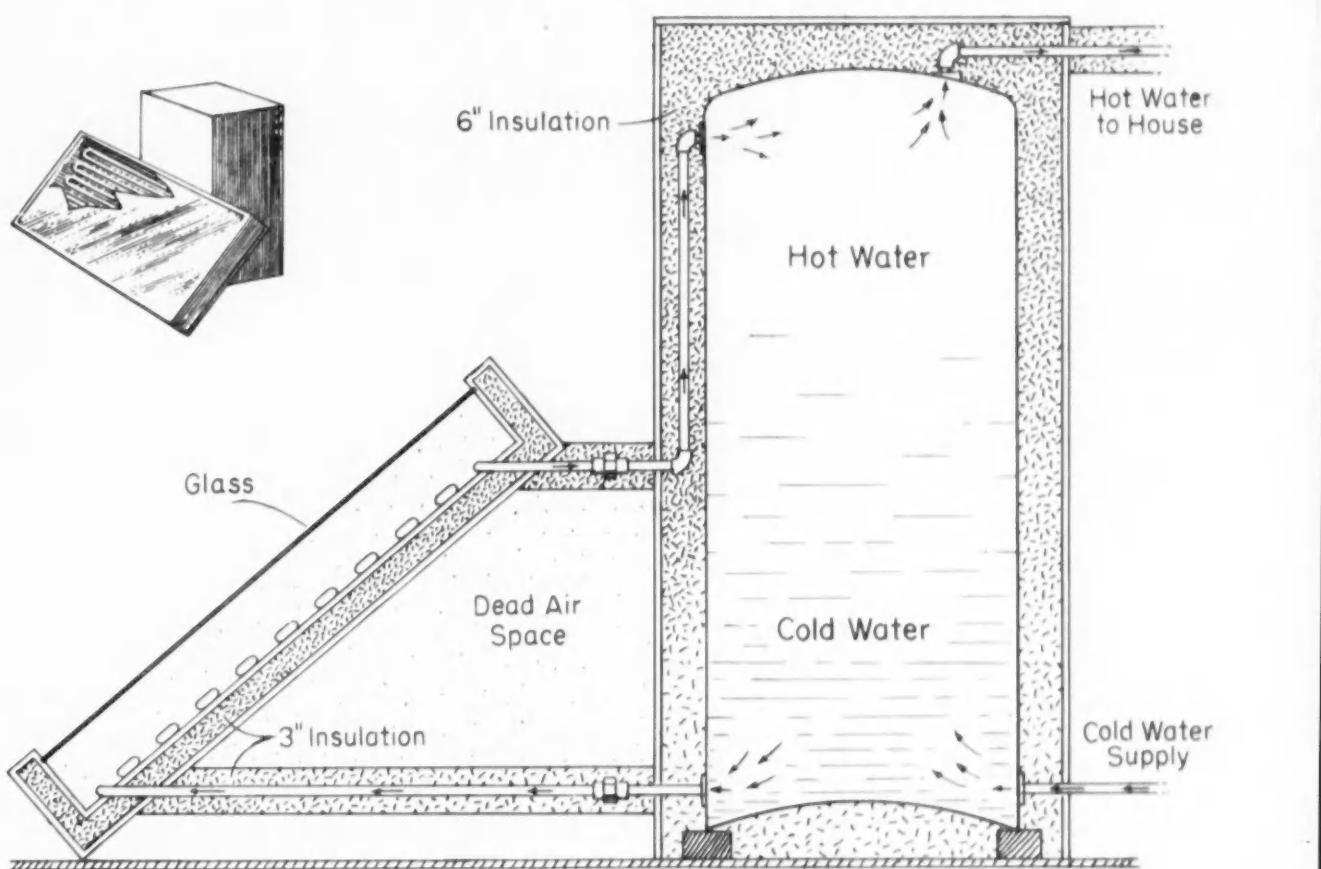
Meanwhile, construction was started on the house, but it went slowly. One man, working after regular work hours and on weekends and on less than a broken shoe string most of the time can scarcely go much faster.

But after a year a cool house, heavily insulated and finished in asbestos-board, was partially built and ready for occupancy. The rest of the house will be built when time and finances permit.

Large windows face the changing colors of the Sierras to our west and north. To the northeast we have the panorama of the Cosos and the dusky Argus ranges, and due east rise the lavender-misted summits of the distant Panamints which guard Death Valley.

The longer we live on the desert, the more beautiful we find this majestic scenery.

Around our home we have planted cottonwoods, tamarisk windbreaks,



fruit trees and a variety of grapes. It soon became apparent that the four 50-gallon drums we were using to store water did not give us enough capacity.

Once more we went shopping for a bargain and found a 3000-gallon redwood tank formerly used by a winery. We brought the monster home with bated breath across the Cajon Pass, securely tied on the bed of our pick-up.

It required diligent cleaning, soaking and liming to remove the dark wine stains from the interior. What a wonderful sight it is to see that monstrous tank atop the tank-house — 3000 gallons of our own water!

Now my husband was ready to harness the sun.

The solar hot water heater he built for our household and shower use produces water that is every bit as hot—and often hotter than that heated by gas or electricity—summer or winter!

It has two main parts, the heat-exchanger section and the storage section.

The former consists of 100 feet of three-quarter-inch copper tubing bent

into a coil and placed into a box seven inches deep and large enough in width and length to hold the coil. Shaping copper tubing is a delicate skill and unless one has experience in this type work he may have to get some help. An easier method is to use black iron pipe, although this takes longer. Cut and thread 20 pieces of three-quarter-inch pipe seven feet long and connect these pieces with return bends to form a flat coil.

Allow space in the bottom and sides of the heat-exchanger box for three-inches of rock wool and cover this insulation with plywood.

Both the coil and the plywood inside the box should be painted a dull black, which will absorb heat, and then covered with glass. The heat-exchanger box should be installed atop your roof at a 35-degree angle facing south so it will catch the maximum amount of heat from the sun during the colder winter months.

The storage section consists of an 82-gallon water tank, insulated with six-inches of rock wool. Connect the two ends of your coil to outlets in the top and bottom of the tank with the same size tubing as used in the coil.

Opposite these outlets should be two other openings, the bottom one leading to the water supply and the one on top piping the hot water to the house.

We enclosed our entire storage tank in plywood and painted it for neatness' sake.

Here is how this appliance works: when the infra-red rays of the sun strike the heat-exchanger coils, they cause the heated water within the coils to rise and enter the top of the storage tank.

As the water circulates the warm water rising in the coils is displaced by incoming colder water from the storage tank. As long as heat reaches the coils, circulation will take place, eventually heating the entire tank of water.

This is called thermo-syphoning and compares very much to the cooling system of the old Model T Fords which did not use water pumps.

Of course, this method of heating water is not new, but for those of us who live in the Southwest it is a practical and inexpensive way to have hot water throughout the year.

LETTERS

Fond of Mesquites . . .

Willits, California

Desert:

Cap Smith's account of the Ironwood in the December, 1955, *Desert* interested me greatly for his feeling toward his venerable patriarch is the same I have in regard to one particular Mesquite tree.

It is growing at the far western end of Clark Dry Lake and is the largest spread-out tree of its kind I have ever seen, but not the tallest.

I have camped under this tree many times. It affords convenient spots for my bed-roll, water cans, grub box, etc.

After a rain it is impossible to drive a car over the lake, so a road was made around it which one can drive in any season. This road is the best route to my mesquite for it is difficult to locate from the lake.

This Mesquite is old but still very much alive, and it is my most earnest wish for it to live many more years.

H. E. W. WILSON

Not Main Spring . . .

San Francisco, California

Desert:

I don't know what spring Walter Ford was looking at in his account of Las Vegas Spring (*Desert*, April, '56), but it was not the main spring. It is located three miles west of the old ranch house and I believe it is now boarded up.

It was a great body of water boiling from the ground—probably 400-inches, which made quite a sizable stream. All of this water, except a small flow, was bought by the railroad when it founded Las Vegas.

After the Mormons left the well was not bought by O. D. Cass, as reported, but by O. D. Gass who lived in that region from the 1870s to 1882.

T. R. GASS

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Rockhound's Lament . . .

Fontana, California

Desert:

In years past I have done some serious prospecting, but as of late my wife and I have become ardent rockhounds of the Mojave Desert. It's getting so we can't search a wash or bajada without trespassing on someone's mining

claim or stumbling across a prospect hole.

Nine times out of ten I am unable to answer my wife's questions regarding the minerals being sought in these holes which leads her to doubt my mining knowledge. It is all very discouraging.

BEN F. CROSS

• • •

Pegleg Mine Rediscovered . . .

Redondo Beach, California

Desert:

I am sending you the first of a two-part account of my rediscovery of the Lost Pegleg Smith Gold Mine. Read it over carefully, syndicate it, print it, and send me a nice fat royalty check for my efforts and I will send you the other half of the story—the complete story about the most fabulous gold strike ever to be made in all time—a strike to outdo the Gold Rush of '49 many times over.

I will prove that the gold is still where Pegleg Smith first found it. Directions in Part II of my story will lead you to a five-square-mile field where there is more gold than can be found at Fort Knox. The fact that gold nuggets can still be found in large quantities should be convincing enough to satisfy even the most skeptical of hard headed pessimists.

I won't guarantee that if you go there you will or will not get shot in the back like the prospector in Part I of my story did.

I am also placing this story with another publisher and if I don't get the results from your office, or the office of the other publisher, that I expect, I will give the story to the newspapers. Any eastern newspaper would like to scoop you western publishers, especially if you lack the foresightedness to see the potentialities of a story such as this.

NEAL O'REILLY

Dear Neal O'Reilly: Congratulations on your discovery of the Pegleg Mine. But I am afraid that if we ran a story telling where the Pegleg gold is located some greedy bozo might rush out there and beat you to it. Since you have gone to all the trouble of re-discovering this rich placer field, I think you, more than anyone else, are entitled to the fruits of your toil. We want to be fair with the prospectors, and we just don't think it would be right for us to publish the story before you have gathered up enough gold to make you rich and happy the rest of your life. After you have done that it really will not make much difference whether any dumb short-sighted editor buys the story or not. —R.H.

Picture-of-the-Month Contest . . .

Photography is an integral part of any desert adventure for there is so much to see and to record. And the abundance of sunshine and early morning or late afternoon shadows greatly contribute toward making these photos even more outstanding. Each month *Desert Magazine* selects for its readers two of the best of these photos and reproduces them in our Pictures of the Month page. This contest is open to all and cash prizes are given for the photographs chosen.

Entries for the June contest must be sent to the *Desert Magazine* office, Palm Desert, California, and postmarked not later than June 18. Winning prints will appear in the August issue. Pictures which arrive too late for one contest are held over for the next month. First prize is \$10; second prize \$5. For non-winning pictures accepted for publication \$3 each will be paid.

HERE ARE THE RULES

- 1—Prints for monthly contests must be black and white. 5x7 or larger, printed on glossy paper.
- 2—Each photograph submitted should be fully labeled as to subject, time and place. Also technical data: camera, shutter speed, hour of day, etc.
- 3—PRINTS WILL BE RETURNED WHEN RETURN POSTAGE IS ENCLOSED.
- 4—All entries must be in the *Desert Magazine* office by the 20th of the contest month.
- 5—Contests are open to both amateur and professional photographers. *Desert Magazine* requires first publication rights only of prize winning pictures.
- 6—Time and place of photograph are immaterial, except that it must be from the desert Southwest.
- 7—Judges will be selected from *Desert*'s editorial staff, and awards will be made immediately after the close of the contest each month.

Address All Entries to Photo Editor

The Desert Magazine

PALM DESERT, CALIFORNIA

Wildcat Offspring . . .

Genoa, Nevada

Desert:

Mrs. C. H. Mitchell's letter (*Desert*, March '56) regarding a half-breed wildcat brought to mind a similar animal that I once owned.

In the '30s our persian cat gave birth to a peculiar kitten that the children immediately named "Monkey Blood." This cat was tall, gray striped, had heavy legs and would hide from strangers. It liked to climb the tallest trees and leap 10 to 12 feet from limb to limb. It was not at all docile and when we attempted to pet him, Monkey Blood would hiss and growl although he never bit anyone. At feeding time he was very calm and got along with the other cats, but he preferred to be left alone. When he was a year old, he disappeared into the nearby Sierra Nevadas.

I often wonder if this cat was sired by a wildcat.

WALTER S. YOUNG

• • •

Praise for Prospector . . .

Chicago, Illinois

Desert:

I have noted with interest comments on the January, 1955, cover, *The Prospector*, with salty criticism as to his "true to life portrayal."

Early in 1942 I met such a desert wanderer who was endeavoring to keep clean both over and under clothing as well as his skin. He had been out long enough so that he was holding conversations with himself—and quite intelligent ones! He knew how to find the waterholes and springs to make the most of them.

To me he was of the new generation and refused to carry the chesty mud cakes so prevalent with the older genera. I have placed the January cover picture in a suitable wormwood frame and it makes a most attractive picture which I have dubbed "the Collegian," starting a new era in prospecting duds and equipment and their arrangement.

CARL WENDRICK

• • •

Abandoned in Desert . . .

Tujunga, California

Desert:

While traveling the lonely stretch from Rice Road to Amboy we stopped to investigate a campsite. In a way I wish we hadn't.

We found a dead campfire, a coffee can full of water and a can of dog food pressed from its container—untouched and dried out. Around the campfire was a circle of tracks left by an apparently abandoned small dog. I wonder how many hours that poor animal paced back and forth around that campfire waiting for his owners to come back for him?

We watched for him down the road,

but I guess the coyotes had long since saved him the trouble of finding his masters.

PAUL CHILDERS

Mule Couldn't Move . . .

Tujunga, California

Desert:

Hardrock is a danged liar!

Pisgah weren't nowhere near Eagle Mountain mine (*Desert*, March '56)—I know 'cuz I were there and know first hand you can't pull shoes off a mule like Hardrock sez. When they get on that magnetic iron the mules jest can't move.

When I found my mule stuck, I had to walk near 10 miles back to camp for a file, nippers, hammer and a chisel to git her loose from them shoes. Like to not made it 'cuz she got mad at me and kept tryin' to kick my head off.

This was in '79—two years before Pisgah ever showed up in the territory. If anyone finds four mule-shoes stuck on them rocks with the nails still in 'em, they belong to me—but I ain't got no use for 'em now. I traded my mule fer a jalopy, and I ain't found no pay ore since.

PAUL BUNYAN CHILDERS

OBSERVERS CLOCK DESERT TORTOISE AT .30 M.P.H. SPEED

Tortoises are known in legend and folklore for their leisurely ways and slow gait. That this reputation is justified is clearly shown by the records. The fastest of our land turtles is either the Desert Tortoise (*Gopherus agassizii*) or the Florida Gopher Tortoise (*Gopherus polyphemus*). Angus M. Woodbury and Ross Hardy have studied the Desert Tortoise in Utah and report a series of five tests in which it walked at a speed of .13 to .30 mile per hour. A large Florida Gopher Tortoise walked between .27 and .50 mile per hour in several trials. Only at the "higher" speed did the animal seem to be exerting itself. W. D. Klimstra clocked two Common Snapping Turtles (*Chelydra s. serpentina*) on an overland jaunt of 1830 feet. This distance was covered in two and a half hours, including two short stops during the trip, for a speed of .138 mile per hour. — J. A. Oliver's *The Natural History of North American Amphibians and Reptiles*

Hard Rock Shorty of Death Valley



Hard Rock Shorty was sitting beside the pot-bellied stove thumbing through an old seed catalog when the homesteader who had filed on a claim at the spring in Tulle Canyon came into the Inferno store and walked over to the seed rack.

"Gonna do some plantin'?" Shorty asked.

"Yep. No canned grub for me when I got plenty of water and sunshine to grow my own."

"Yu outta do some experimentin' like ol' Pisgah Bill. He's got more different kinds o' things growin' in that little patch o' garden up Eight Ball crick than you ever saw. The rabbits an' the burros gits most of 'em—but Bill keeps a tryin'."

"Bill has some good ideas—even if they don't work. I remember when he got the notion 'o crossin' mescal with 'spargus. He'd been watchin' them big mescal flower buds shootin' up in the air out of a patch o' daggers. Looks jest like 'spargus, only a lot bigger," he said.

"So Bill went to work tryin'

to figger out how to make them mescal bud stalks taste like 'sparagus. Doesn't take much water to grow mescal, Bill figgered. It'll grow anywhere on the high desert without no irrigatin'.

"Bill did a lotta plantin' an' graftin' an' fussin'—an' the more he worked, the bigger them mescal daggers got. They wasn't used to so much waterin' and pamperin'.

"Then one day one o' them botanist fellers came into camp. He wuz out lookin' fer some rare kind o' somethin' or other.

"Fine patch of agave you have out there," he said, pointin' to Bill's mescal garden.

"Then Bill told him about the 'periments."

"Great scheme," he exclaimed, "but I guess you know those agave plants only send up a flower bud every 15 or 20 years. And then the plant dies. That is the reason they call them century plants."

"Next day Bill dug up his mescal an' planted radishes."

Here and There on the Desert . . .

ARIZONA

Telescope Site Studied . . .

TUCSON—A site for the proposed X-inch giant telescope of the National Astronomical Observatory is being seriously investigated 48 miles southwest of Tucson on Kitt Peak, a 7000-foot-high mountain in the Papago Indian Reservation. The National Science Foundation has budgeted \$5,000,000 during the next three years to start erecting a battery of optical telescopes.—*Los Angeles Times*

Farmland Needs Road . . .

YUMA—Yuma County Farm Bureau wants two communities in northern Yuma County, Parker and Ehrenberg, to be linked with a paved road. Between them, a distance of about 40 miles, lies a great agricultural potential in the fertile Colorado River valley. The land is part of the Parker Indian Reservation. A paved road extends part way between the two towns but lacks about 12 miles from being completed.—*Yuma Sun*

GLORIOUS ADVENTURE



In the Canyons of the Colorado and San Juan Rivers

Sturdy boats and skilled boatmen-guides insure safe and thoroughly enjoyable passage through the most colorful canyons of the Southwest desert.

SAN JUAN AND COLORADO RIVERS

Mexican Hat to Lee's Ferry
7-day trips scheduled in May and June
\$200 for each person

GLEN CANYON OF THE COLORADO

Hite, Utah, to Lee's Ferry
8-day trips in August and September
\$150 for each person

GRAND CANYON OF THE COLORADO

Lee's Ferry to Lake Mead
18-day trip in July
Special charter trips may be arranged.
Write for 1956 summer schedule and rates.

J. FRANK WRIGHT

MEXICAN HAT EXPEDITIONS

P.O. Box 427 Blanding, Utah

State Seeks Dam Townsite . . .

FLAGSTAFF—Arizona's two largest chambers of commerce have sounded a call for cooperation of other communities in the state for establishment of the townsite for the Glen Canyon Dam on the southeast side of the Colorado River. In a joint statement, the Phoenix and Tucson chambers said the locating of the Glen Canyon Dam townsite on the southeast side of the Colorado, rather than the northwest, will have a tremendous effect on Arizona's overall economy. Approximately 20,000 people will be employed for five to seven years while the dam is being built, after which about 3000 will remain permanently to administer the project. Flagstaff will be railhead for construction of the dam.

Climbers Conquer Peak . . .

CHINLE — A three-man team of climbers from the Sierra Club of California conquered Spider Rock in Canyon de Chelly after spending one night lashed to the 900-foot vertical face of the treacherous peak. They were Jerry Gallwas, 19, Chula Vista; Don Wilson, 23, Los Angeles; and Mark Powell, 27, Merced. This is the first conquest of the peak, according to John Aubuchon, superintendent of Canyon de Chelly National Monument.

Customs Extension Sought . . .

YUMA—The Yuma County Chamber of Commerce stands in favor of opening the international border at San Luis 24 hours a day. The Chamber will make its position known to the U. S. Customs Service, which has jurisdiction over border hours. At the present time the San Luis inspection station is open from 6 a.m. to 10 p.m. on week days and all night Saturdays.—*Yuma Sun*

Roadside Parks Planned . . .

PHOENIX—A roadside beautification program, envisioning park rest areas on the state's most heavily traveled roads, is now under way by the state highway department. At the present time 10 new park areas are being constructed and forms have been built for standardized historical markers. Eventually it is planned to have a roadside park rest area every 40 miles on roads with a traffic count of less than 2000 per day and every 20 miles on highways with an average daily count of over 2000. A project due to get under way soon is the designation of

U.S. Highway 89 through Arizona as the Blue Star Memorial Highway. Members of the Arizona Federation of Garden Clubs plan to erect tables, landscape wayside rest areas, bird sanctuaries, arboreta and forests along the route.—*Phoenix Gazette*

25-Ton Rock Removed . . .

WELLTON—A 25-ton stone relic of ancient Yuma County Indian history was removed to Tucson as a trophy of the Arizona Pioneer Historical Society. The huge stone has 11 great depressions worn in it, presumably by Indians grinding mesquite beans. The rock was located at the foot of the rugged Tinajas Altas Mountains south of Wellton.—*Yuma Sun*

Only Two Horses Captured . . .

MESA—Sixty-two chagrined riders from the Fort McDowell and Salt River Indian reservations and the Southside Sheriff's Posse had only two wild horses to show for their Wild-Horse Roundup in Tonto National Forest. The weary horsemen, in the saddle for the better part of two days, were unable to cope with the 80 wily Indian ponies which the forest service estimates are ranging forest grazing lands.—*Phoenix Gazette*

Worst Insects Listed . . .

PHOENIX—Dr. J. N. Roney, extension entomologist for the University of Arizona, listed the 10 most unpopular insect pests in the state in the order of the amount of crop damage they were responsible for: 1. spotted alfalfa aphid (responsible for a \$3,500,000 loss in yields of alfalfa over the state); 2. cotton bollworm; 3. lygus bug; 4. beet armyworm; 5. cabbage looper; 6. salt marsh caterpillar; 7. khapra beetle; 8. cottony cushion scale; 9. leaf roller; 10. serpentine leaf miner.—*Graham County Guardian*

CALIFORNIA

Navy Land Curb Asked . . .

SACRAMENTO—Senator Charles Brown of Shoshone has introduced a resolution in the State Senate asking President Eisenhower and other high officials to block the Navy's land grab of 800,000 acres of Saline Valley land in Eastern Inyo County. The resolution emphasizes that the Senate Interim Committee on Public Lands held hearings in Independence at which time the Navy's representatives testified that they would recommend to the 11th Naval District that "no further acquisitions be made by the Navy for exclusive use of said lands without first making an attempt to devise a plan whereby such use by the Navy would not be incompatible with private uses currently being made of said lands."—*Inyo Register*

Tijuana to La Paz Highway . . .

SAN DIEGO—Plans for construction of a freeway from the international border to Ensenada, Mexico, a fog-free paved road from Tecate to Ensenada, and a highway to La Paz at the southern tip of the peninsula were announced. Construction of the freeway has been started from the border to Rosarito Beach. It later will be extended to Ensenada, following a coastal routing. The grading of a road from Tecate to Ensenada has been completed and a paved roadway 33-feet wide is to be laid as soon as financing is available.—*Los Angeles Times*

• • • Imperial Road Progress . . .

NILAND—The assistant secretary of the Navy for material, R. H. Fogler, has requested the chief of the bureau of yards and docks to negotiate and reach an agreement with the Imperial County board of supervisors as to the Navy's share of the cost of a new road to replace the Niland-Blythe route, closed by the military across the Chocolate Mountains gunnery range.—*Palo Verde Valley Times*

• • • Land Reopened to Entry . . .

JOSHUA TREE—The Bureau of Land Management announced that 50 square miles of Riverside and San Bernardino county land adjoining the Joshua Tree National Monument are now open for filing of five-acre homesteads and mining claims. The opening of the tracts was believed brought about by the release of several hundred thousand acres removed from the Monument in 1950 when it was reduced from more than 800,000 acres to 586,000 acres. The bureau said the 160,000 acres were withdrawn from entry in 1933.—*Indio Date Palm*

• • • Sierra Highway Feasible . . .

LONE PINE—The State Highway Commission announced that a highway from Lone Pine across the High Sierra to Springville and Porterville is feasible. It has been estimated that an average of 300 to 400 vehicles a day would use a State highway between Porterville and Lone Pine and Sunday traffic volumes have been estimated at 1000 vehicles for a 24-hour period.—*Inyo Independent*

• • • Railway Link Planned . . .

PALMDALE—The Southern Pacific Railroad is giving consideration to feasibility of building a rail line in Southern California eastward from Palmdale to provide a route that will connect with its main line at Colton. Over such a route, through freight would bypass the Los Angeles metropolitan area where there is a heavy volume of local and industrial freight traffic.—*Valley Press*

Drama to be Moved . . .

IMPERIAL—The colorful Desert Cavalcade of Imperial Valley, staged in Calexico every spring in years past, will be held in Imperial in the fall of this year. The board of directors ordered the switch after studying the financial losses incurred by the pageant in recent years. Moving the location from the desert amphitheater near the Mexican border to the California Mid-Winter Fairgrounds will facilitate extra seating, directors said. October 27 has been given as the starting date for the Cavalcade and the international theme will be maintained.—*Los Angeles Times*

• • • Acreage Asked for Park . . .

BORREGO SPRINGS—The state may spend \$350,000 to acquire 83,290 acres for the Anza-Borrego State Park which would extend into Imperial and San Diego counties in the next five fiscal years. The net gain to the park would be 42,570 acres, since the Division of Beaches and Parks proposes to rid itself of 40,720 acres it now has which are considered less desirable for park purposes. The project received only honorable mention in the beaches and parks five-year acquisition program which Gov. Knight recommended in his budget message.—*Borrego Sun*

• • • Caltech Plans Telescope . . .

BIG PINE—A \$500,000 twin telescope that may record radio waves from objects farther away than any that can be recorded by Palomar's 200-inch light telescope is to be built by Caltech six miles from Big Pine. Designed to be the world's greatest instrument for decoding the mysterious radio-like waves received from the cosmos, the instrument will consist of two giant radio telescopes, each of which will run on a 2000-foot-long track.—*Inyo Register*

KENT FROST JEEP TRIPS

Into the Famous
Utah Needles Area

Junction of the Green and Colorado rivers, Indian Creek, Salt Creek, Davis Canyon, Lavender Canyon, Beef Basin, Elk Mt., Lock Heart Basin, Monument Canyon, Dead Horse Point, Grand View Point, Red Canyon, Noki Dome, Bridges National Monument, Hovenweep National Monument

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Community Hunts Doctor . . .

AUSTIN—Austin is looking for a doctor—with an M.D. degree—and county commissioners have made it clear that they are ready to subsidize a doctor to some extent. The community's present desire for medical service is not due to any general failure in health, but is occasioned primarily by the persistence of miners, prospectors, cattlemen and others in contriving to get themselves hurt. Accidents are increasing throughout the area, it was reported.—*Reese River Reveille*

• • • Caves Plan Approved . . .

ELY—Members of the Utah-Nevada Lehman Caves Committee voted to continue to investigate the possibilities of making 28-square-miles of Lehman Caves-Wheeler Peak area a national park. The plan agreed upon calls for consultation with the Forest Service on grazing rights and the working out of arrangements to minimize any damage to existing economic interests in the area. A survey of the proposed park area has been ordered by the Park Service and the Forest Service.—*Pioche Record*

• • • Small Tract Acreage . . .

ELY—More than 500 small tracts with a total area of approximately 2767 acres, located along or near Highway 93-50A between Ely and McGill, have been classified for lease and sale under the Small Tract Act.—*Ely Record*

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Lake Mead Travel Up . . .

LAKE MEAD—A new tourist record appears to be in the making this year for the Lake Mead Recreation area. The first quarter figures of the new year as announced by Charles Richey, superintendent, show a 33 percent increase over the same period of the preceding year. Last year, incidentally, was a record year for tourism. —Mohave County Miner

Tourist Courtesy Classes . . .

CARSON CITY—First of a series of schools designed to give those who come in contact with tourists tips on how to give information courteously and accurately got underway in Carson City in early April. The tourist training programs are sponsored jointly by the Department of Economic Development and the State Department of Vocational Education. The classes will strive to impress upon those who meet tourists the importance of the industry to Nevada. — *Nevada State Journal*

• • • U. S. to Aid "Itchy" . . .

IONE—Arthur G. Nord, in charge of regional planning for the U.S. Forest Service in the Intermountain States with respect to recreational, historic and archeological sites, said that his department is interested in bringing about a cooperative program between the federal agency and the Nevada State Park Commission for development of the 500-acre Ichthyosaur Park area in Nye County (*Desert*, December '55, p4). Thousands of visitors have already visited the archeologically important site, and there is some evidence of vandalism.—*Nevada State Journal*

NEW MEXICO

Coyote Numbers Increasing . . .

ELY—Lyle Autry, C-B Land and Cattle Company exterminator, reported that the coyote population is increasing in the Ely area. For some time the coyotes were kept in reduced numbers by use of poisoned horse meat, but Autry said the animals are becoming suspicious and will not take the bait. — *Ely Record*

• • • Geophysical Year Activities . . .

ALAMOGORDO — Alamogordo will be a focal point in the celebration in 1957-58 of the International Geophysical Year—a massive study by 42 nations of man's environment, particularly the atmosphere and the oceans. Many projects are planned at nearby Holloman Air Force Base and Sacramento Peak Upper Air Research Observatory.—*Alamogordo Daily News*

• • • Tunnel for Abiquiu Dam . . .

ABIQUIU—Contract for construction of a \$3,000,000 tunnel 12-feet in diameter more than a third of a mile through the rocky Chama River gorge wall is scheduled to be let by the Corps of Engineers May 31. This will mark the first phase of construction of the big Abiquiu dam. The

tunnel will provide the outlet for releasing water from the flood control reservoir. Work on the actual dam structure — part of the \$27,000,000 Abiquiu-Chamita flood control system — will not be started until the outlet tunnel is completed. It will take an estimated two years to bore the hole. Meanwhile a delegation of Texans and New Mexicans urged the Corps of Engineers to install a spillway in Abiquiu Dam to free any water over 700,000 acre feet. Present plans are for an outlet to free impounded water after it reaches 1,200,000 acre feet. The dam will be on a tributary of the Rio Grande and irrigation farmers downstream in New Mexico and Texas fear too much water might be stored.—*New Mexican*

• • • Hopper Danger Seen . . .

SOCORRO — Socorro, Catron and a part of Sierra county are expected to bear the brunt of a grasshopper infestation in New Mexico which may be three times as bad as last year, agriculture experts warned. Ranchers, Federal Government and State share the cost of grasshopper control which is expected to be about \$91,000 each for the threatened area.—*New Mexican*



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SF Land Office Closed . . .

ALBUQUERQUE—Santa Fe Railway went out of the land business on April 1, terminating the company's historic land department in Albuquerque. All that remains of the original 14,000,000 acre land grant which cut a diagonal swath across the territories of New Mexico and Arizona in alternate sections is 1650 acres in the former state and 150,000 acres in the latter.

* * *

Carson Park Dedication . . .

TAOS—The Kit Carson Memorial State Park at Taos will be dedicated during ceremonies to be held on Memorial Day, according to an announcement by Mrs. Marion Estergreen, chairman of the park board. Top state officials, members of the Carson family, representatives of Taos Pueblo and others will take part in the ceremony.—*El Crepusculo*

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PALM DESERT, CALIFORNIA

Solar Furnace Drafted . . .

ALAMOGORDO—The air force will turn to the sun for energy to fire the hottest furnace "known to exist in the world today." It will be done with mirrors in a solar furnace to be built soon at a spot 9000 feet high in the Sacramento Mountains near Holloman Air Development Center, Alamogordo. The Air Force said the furnace may attain temperatures of 7000 to 8000 degrees Fahrenheit over a "substantially larger area than any other furnace known to exist." The Air Force said such terrific heats are needed for advanced research and testing of materials for use in high speed, high altitude aircraft.—*Phoenix Gazette*

Tradition Drift Cited . . .

SANTA FE—City Councilman Leo Murphy says he is worried that his historic city might lose its ancient face. He called for a comprehensive planning study to insure orderly development in order to retain the qualities and characteristics that make Santa Fe an attractive place to live in and to visit. "Study should be given," said Murphy, "with the view in mind of retaining the charming characteristics so closely associated with the historical landmarks of our city." He said he would like to see homes and commercial buildings kept to the traditional styles.—*Alamogordo Daily News*

Memorial Having Problems . . .

GALLUP—A peculiar land problem has temporarily snagged plans for a nine-million-dollar living memorial to the American Indian. The search continues in Gallup for a suitable site for a proposed National American Indian Center whose contribution to Indian welfare and American culture, according to the foundation backing it, "would be limited only by our country's sense of obligation to the American Indian." The land problem stems from the fact that every other section in the area is owned by the Navajo Tribal Council and, according to one committee member, the Indian is naturally suspicious and resentful of any move by a non-Indian to take over his lands.—*New Mexican*

• UTAH •

Grazing Ban Studied . . .

WENDOVER—Assurance has been received from the Air Force that it will re-examine a previous decision to ban grazing on 66,000 acres of range land near Wendover Air Force Base. Rep. William A. Dawson of Utah said the pledge was given after he protested that the grazing ban would cause extreme hardship on stockmen using the range and threatened to put some of them out of business.—*Salt Lake Tribune*

Youth Forest Planted . . .

BRIGHAM—Eight thousand lodge pole pines were planted at the entrance to Box Elder Park in April in a project sponsored by the Northern District, Utah Federated Women's Clubs. Planting of the three-year-old trees was supervised by members of the U. S. Forest Service and the Utah Foresters from Utah State Agricultural college. Youngsters representing youth groups from Cache and Box Elder Counties did the actual planting.—*Box Elder News*

Access Roads Endorsed . . .

ST. GEORGE—A group representing southern Utah civic clubs, business interests and county governments met recently and passed resolutions endorsing access roads through Utah to the Glen Canyon dam site. Purpose of the organization, known as Glen Canyon Dam Access Road Committee, is to coordinate efforts of communities in southern Utah regarding the access road question.—*Washington County News*

• Park Improvements Slated . . .

WASHINGTON, D.C. — The National Park Service plans to spend \$16,345,000 on improvements for its two parks and nine monuments in Utah during the next 10 years. More than one-fourth of the proposed outlay is earmarked for Dinosaur National Monument. There it is planned to spend \$2,433,000 on roads and trails and \$1,746,000 on buildings and utilities. The park service's so-called Mission 66 program calls for the expenditure of \$3,411,000 for Zion National Park and Monument; \$1,134,000 for roads and \$744,000 for buildings at Bryce National Park; Arches, \$2,409,000; Capitol Reef, \$1,651,000; Cedar Breaks, \$1,354,000; Natural Bridges, \$975,000; Timpanogos, \$233,000; Rainbow Bridge, \$171,000; and Hovenweep, \$84,000.—*Salt Lake Tribune*

• Bryce Highway Progress . . .

TROPIC—Road Commissioner Lorenzo Bott announced that the State is making application with the Federal Government for public lands funds for the construction of 4.5 miles of roadway within Bryce National Park on State Road 54, including the reconstruction of Water Canyon Wash Bridge, 3.7 miles east of Tropic, and Tropic Wash Bridge, 3.3 miles east of Tropic Junction. The total cost of the roadway and two bridges is estimated at \$280,000. Bott also made known that a contract has been awarded for the construction of the Paria Creek Bridge and approaches, in Garfield County, in the amount of \$219,500.—*Garfield County News*

MINES and MINING

Santa Fe, New Mexico . . .

Legislation to extend the federal mica program four years beyond the 1957 expiration date was introduced in the Senate by New Mexico Senator Dennis Chavez and other western state senators. The legislation comes at a time when New Mexico is putting considerable effort into an expansion of mica in northern Rio Arriba County in an effort to bolster the economy in that area on a long-time basis. The New Mexico Economic Development Commission is engaged in a thorough study of mica production possibilities in the state, particularly in the Petaca area.—*New Mexican*

Henderson, Nevada . . .

The Titanium Metals Corporation of America announced that it will nearly double its plant facilities at Henderson before the end of the year, making the southern Nevada operation the largest of its kind in the nation. Present capacity of 3600 tons of titanium sponge—the hard, porous, primary form of titanium—will be increased to 6000 tons a year as a result. The new facilities will be constructed independent of government contractual guarantees.—*Pioche Record*

Yucca, Arizona . . .

The 120-ton flotation mill at the Antler's Mine went into operation in early April on a one-shift basis. Mill officials said they hoped to be working three-shifts by May 1. The mine has produced over a million dollars in copper and zinc in the last seven years and is presently being operated by the Samicol Mineral Corporation of Santa Fe, New Mexico.—*Mohave Miner*

Rifle, Colorado . . .

Union Oil Company of California's pilot plant program for recovery of oil from shale near Rifle, Colorado, will be in operation by the end of next summer, it was announced by W. L. Stewart, Jr., senior vice president. He reported also that Union was expanding its foreign sales staff for anticipated sales of anhydrous ammonia stocks when supplies in U.S. exceed domestic consumption level.—*Salt Lake Tribune*

Fallon, Nevada . . .

Truckee Carson Irrigation District has approved a lease on approximately 23,000 acres of land under its custodial control, to the Central Twelve, Inc., an organization of Fallon businessmen. The company announced that it will be its purpose to attract major petroleum companies or well financed wildcatters to explore the Fallon area for possibilities of finding oil or gas in commercial quantities.—*Humboldt Star*

Flagstaff, Arizona . . .

The approval of Glen Canyon dam has caused two proposed Northern Arizona cement plants to go forward with development plans. The two enterprises, which have been under discussion for several years, include one to be built from the remodeled smelter at Clarkdale, and one to be built at Drake. Verde Valley Industries has retained Dent B. Diehl, president of the Texas Portland Cement Co., to design and construct the Clarkdale plant. The Republic Cement Corp. announced it will build a plant at Drake, 18 miles north of Prescott.—*Coconino Sun*

Carson City, Nevada . . .

Nevada mercury mines during 1955 produced 5549 flasks of quicksilver—30 percent of the national output—reported the U. S. Bureau of Mines. As a result of large exports of mercury from Mexico, the market for quicksilver is weaker and supplies are said to be increasing as the mid-point nears in the 1956 mining year. Effective in the fourth quarter of last year, the Bureau of Foreign Commerce announced that mercury would require licensing for export, but would not be subject to quantity control.—*Nevada State Journal*

Apple Valley, California . . .

Forminco, Inc., a \$150,000 mining corporation formed under the laws of Pennsylvania, has established headquarters in Apple Valley. According to D. A. Benson, president of the corporation, the firm will concentrate on tungsten and gold development in the nearby Fry, Ord and Rand Mountains.—*Victor Valley News-Herald*

Phoenix, Arizona . . .

Uranium prospectors, miners, recreationists and conservationists received word from the U. S. Forest Service that it is putting new mining law provisions into action in Arizona. The new federal mining law integrates land usage on National Forests under mineral claims with game and other conservation purposes and for industry and recreation. Examination of thousands of old mining claims is under way and the agency urged claim owners to place their holdings under voluntary provisions of the law to save themselves time and the government cost of long drawn-out examinations and hearings.—*Phoenix Gazette*

Kimberly, Nevada . . .

Consolidated Coppermines Corporation added more than 16,000,000 tons of ore to its reserves during 1955, invested \$1,700,000 in capital improvements, increased its mining payroll to 325 persons and in spite of a long shutdown of the processing plant to which the ore is shipped, produced 35,278,526 pounds of copper, according to a report by Chester D. Tripp, president of the corporation. "We now feel that we have 10 years or more of further mining operations in sight," Tripp said.—*Ely Record*

Salt Lake City, Utah . . .

The International Union of Mine, Mill and Smelter Workers was told recently employment in the non-ferrous metals industry was reduced by 14,000 jobs in 1955 despite "startling productivity advances . . . and exceptional profits." Mine President John Clark said that notwithstanding increased production, employment in the non-ferrous metals industry has declined 17 percent since 1947. He added that there are indications the trend will continue.—*Nevada State Journal*



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Carson City, Nevada . . .

Nevada is in the midst of a minor boom in silver production following a period of several years in which the trend was steadily downward, according to the Bureau of Mines. Preliminary 1955 production figures indicate a 48 percent increase over 1954 output.—*Reese River Reveille*

Albuquerque, New Mexico . . .

One of the most significant oil discoveries ever made in the Four Corners area, the Texas Co. No. 1-C Navajo, has been completed, flowing 1704 barrels of 43.3 degree oil per day through open two-inch tubing.—*Pioche Record*

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A solvent extraction process which greatly reduces the cost of processing uranium from Colorado Plateau ores has been perfected by the United States Bureau of Mines. Applicable to acid treatment of ores as distinguished from alkaline leaching, the process is a result of research by J. Bruce Clemmer, chief, and J. R. Ross and J. B. Rosenbaum, all of the division of Minerals Technology of the Salt Lake station of the Mines Bureau.

"Solvent extract is the coming acid process for routine production of uranium concentrates," Clemmer said. "The inherent flexibility and wide choice of reagents and techniques makes the method applicable to most ores suitable for acid processing."

Cost of milling uranium ore has been

reduced by more than 30 percent in the last several years, an official of the Atomic Energy Commission said. As a result of new flow sheet development, cheaper processing costs have been attained in recovery of uranium, W. H. Lennemann, metallurgical advisor to AEC's Grand Junction Operations Office declared.

• • •

Atomic power scientists estimate that one pound of uranium metal, slightly larger than a one-inch cube, can produce the same amount of energy as 3,000,000 pounds of coal. This power could light the city of Chicago for a full day or the average home for 9000 years—longer than recorded history.—*Pioche Record*

New AEC Rate Schedule Boon to Plateau Miners

The AEC's new purchase schedule for high lime content uranium ores sold at Monticello and Moab, Utah, provides a welcome and necessary relief for miners in these districts, reports Robert W. Bernick, *Salt Lake Tribune* business editor.

However, adds Bernick, as the schedule allows the shipper who elects no penalty on lime no return for vanadium, there are bound to be those who will object on some ground or another.

Two schedules are listed in the circular being sent to Moab-Monticello area miners and millers.

Schedule I is the same as exists at present and provides a penalty of 30 cents a ton for each percent of lime above the permissible six percent maximum. There is also a basic dollar-a-ton charge for excessive lime content ores.

The new Schedule II replaces the old levy of \$3.70 a ton on high lime ores. It states: "Payment for high lime ores delivered to and accepted at the commission buying station will be at prices set forth in domestic uranium program circular 5, revised, except that no payment will be made for vanadium or any other constituent of the ore."

• • •

Discovery of pitchblende ore has been made on the Orphan claim 1300 feet down the slope from the South rim of the Grand Canyon in Arizona by Golden Crown Mining Co., a subsidiary of Western Gold and Uranium, Inc. According to Ralph G. Brown, president of the firm, the strike is estimated to contain at least 100,000 tons and possibly 300,000 tons or more of marketable ore in a "stovepipe" formation extending almost vertically. Depth of the deposit has not been determined.—*Pioche Record*

• • •

An officer of United Western Minerals, Inc., said his company has received four proposals for construction of processing mills near its uranium holdings in New Mexico. Alva Simpson of Santa Fe, company president, also reported a \$130,000 exploration program is underway to determine the exact size of the ore bodies in the Ambrosia Lake area 26 miles north of Grants.—*New Mexican*

• • •

What are probably the first patents issued on lode uranium mining claims in Utah were made effective in late March by the United States Government. Patents were issued to the Utex Exploration Co., Moab, covering the Mi Vida mine and 10 other claims.—*Salt Lake Tribune*

Prospectors' Headquarters

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Federal Uranium Output Hits 4000 Tons Monthly

Federal Uranium Corporation is now shipping ore at a rate of over 4000 tons monthly from two of its five producing mines, W. D. Nebeker, president, told stockholders in a quarterly report.

Production now is at a rate of 100 tons a day from the Radon Mine (or 3000 tons monthly) and 1000 tons monthly from the Oakie Mine at Elk Ridge District, he said.

At the Glen Williams Mine in New Mexico's Haystack Mining District, drilling has increased ore reserves by 10,000 additional tons and production, which amounted to 4064 net tons after acquisition by Federal, is increasing. Drilling has blocked out to date an 8700-ton ore body on the Elizabeth Group of claims in Mesa County, Colorado, and production, which has just started is increasing.

Production has been regular and increasing on properties of subsidiary Plateau Mining Co.—*Salt Lake Tribune*

• • •

New York Firm to Run Monticello U-Ore Plant

National Lead Co. of New York has taken over operation of the government-owned uranium processing mill at Monticello, San Juan County, Utah.

Grand Junction Operations Office of the AEC made the announcement after execution of an agreement between the commission and the firm. National Lead enters the picture after announcement by the Galigher Co., Salt Lake City, that it would not seek renewal of the contract on expiration March 31.

National Lead, which is a prime contractor for the AEC, participated with the commission in development of resin-in-pulp processes used at Monticello in reduction of uranium ore.—*Pioche Record*

• • •

Apex Uranium's first carload shipment of ore from the Austin area has broken all records for Nevada, returns proving it is the richest uranium shipment ever made in the state. Control assay put the value of the ore at \$99.12 a ton—a total value for the carload of approximately \$5000. The first shipment was a test carload, and Apex officials appear uncertain at the moment as to just when it will be followed by another carload, although more will be made as fast as ore accumulates. —*Reese River Reveille*



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Atlas Seeks Approval Of New Uranium Mill

Atlas Corporation has filed initial proposal with the AEC to erect a multi-million dollar uranium mill at Big Indian District, San Juan County, Utah.

Vehicle is the Ute Milling Co., an affiliate of Atlas' wholly-owned subsidiary, Hidden Splendor Mining Co. It is anticipated that Homestake Mining Co. will have a financial

interest in Ute Milling Co., the proposal states.

Hidden Splendor would do the mining on the several major ore bodies being brought under control of Atlas and its affiliates in the district. Homestake itself operates two mines in the district through affiliates.

It is probable that the proposed mill—one of the largest ever to be built in the United States—will be located near the Cal-Uranium mine or at least the north end of the district—*Salt Lake Tribune*

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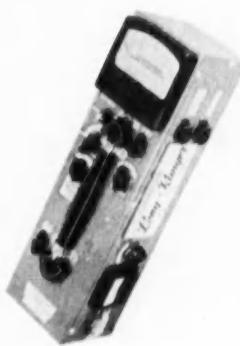
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Texas Co. Given Option On Happy Jack U-Mine

The Texas Co. has been given option to buy the Happy Jack uranium mine in White Canyon, San Juan County, Utah, from Bronson and Cooper Mining Co., Monticello. The Texas Co. is majority shareholder in New-Shat-Tex Corp. in which

New Jersey Zinc Co. and Shattuck-Denn Mining Co. share interests. New-Shat-Tex already has made a completed proposal for establishment of a uranium mill and uranium oxide treatment plant to be built on Navajo Indian lands near Mexican Hat, San Juan County, Utah.—*Salt Lake Tribune*

Stockholders of Apache Uranium Corporation approved merger into and with International Oil & Metals Co., Spokane, Washington. Apache shareholders will receive one share of International for each 30 shares held.—*Salt Lake Tribune*

New and Improved Products for Desert Living

HICKORY FUEL AVAILABLE TO BARBECUE ENTHUSIASTS

The Hickory Nuggets Co. of Wilmette, Illinois, introduced nationally a new Carya-alba hickory fuel that will be sold under the trade name "Hickory Nuggets." Each bag contains separate pieces of hickory bark so outdoor chefs can vary their hickory flavoring. The manufacturers claim their product is a clean cooking fuel and imparts a deliciously sweet hickory flavor to food cooked over it. Carya-alba hickory grows principally in Mississippi and Alabama. Fuel bags will sell for approximately 10 pounds for a dollar. Instructions for best cooking results come with each bag.

LOW PRICED URANI-TECTOR MAKES IDEAL GIFT ITEM

Designed for both amateur and professional prospectors, the Urani-Tector Uranium Kit is inexpensive and simple to use, the manufacturers announce. The kit contains all materials needed to prospect for uranium and has actually found uranium passed up by expensive counters. Urani-Tector Kit includes a detector, four samples of uranium from commercial mines, and chemicals for appraising the uranium. Ideal gift for outdoor man, boy or girl prospector, vacationer, hunter, fisherman. \$8.49 ppd. from CMG Industries, Box 611, Laramie Wyoming.

CAR COOLER RE-DESIGNED

Frigikar Corporation, 1602 Cochran, Dallas, Texas, announced the addition of new features to its refrigerated automobile air conditioner, "Frigi-king." The 1956 models will have a new control system, re-designed case, green-dot light on the face of the case that remains lighted only when the unit is refrigerating, and plastic 360-degree directional air control louvers. The unit sells for \$298 plus installation.

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GEMS AND MINERALS

I Found Nature's Lapidary Near Pozo Blanco, Arizona

When Jack C. Moomaw of Estes Park, Colorado, shows the chalcedony roses he found in Southern Arizona years ago, people do not believe that Nature fashioned these striking pieces. Here is Jack's yarn of a routine roadside stop and his lucky discovery.

By JACK C. MOOMAW

Photographs by the author

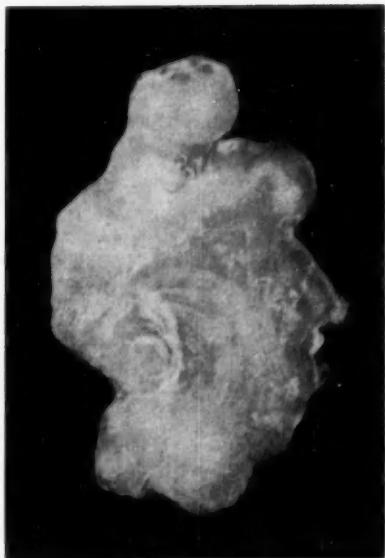
Many years ago the wife and I and the three dogs were driving east across southern Arizona on state route 86. After we had gone 40 miles from Ajo, the dogs said they wanted out. So, we stopped at the roadside near a sign that read, "Twelve Miles to Water." I later determined that we were three miles west of Pozo Blanco.

The dogs, as dogs will do, went about their sniffing and investigating in the process of which they flushed a rabbit. And away they went, barking and in full sail. While the wife, as wives will do, implored me to do something about it.

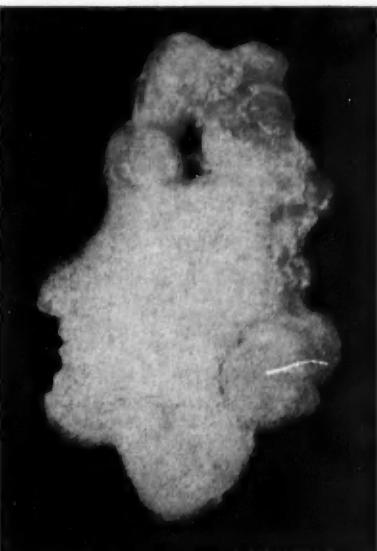
There was a small 100 foot high mound nearby, more on the order of a cone, from which one could look into infinity in all directions. I had read or heard somewhere that rabbits, when pursued, run in a circle and come back, eventually, to home base. Here was an excellent opportunity to see if I had been misinformed. So, I hastened to the summit of the cone.

As near as I could observe, as I watched the chase, this rabbit knew nothing about the theory of curved space but was a firm believer in that of an expanding universe.

Nero



The wife's blond cocker soon came back, but the terriers continued their chase. While I waited I picked up an arrowhead and, while looking for more relics, found that the hill was littered with chalcedony roses. The largest pieces were the size of silver dollars and most of them were flat. But they had beautiful patterns in whorls and fine crystals and the snow-white material was



Catherine the Great

mottled with tints of red, pink and yellow. With very little imagination one could make out in these shapes and patterns, busts in profile; heads of humans, dogs, horses and other animals including reptiles with scales and eyes. Naturally, I stuffed my pockets.

After a while the terriers, with tongues hanging, came limping back. And we, everybody happy, went on our way.

Several years later I somehow became immersed in the lapidary hobby and, remembering the agate heads, dug them out

Snakes



Hanibal

of the attic. Some of them, without any work at all, made beautiful pendants. Others, with a little chipping of patina here and there to bring out the profiles, made intriguing ornaments. And many people wondered how I could have carved them. They would not believe that they were natural.

The thought, of course, came to me that primitive men might have shaped them, but archeologists, after seeing the stones, say, "No." But some geologists have been puzzled.

FOSSIL QUALITY ENHANCED WITH DEXTRINE TREATMENT

Those who have fossil plant specimens that are not of the highest quality will be interested in the following method of treatment to increase their value. It is suggested by George Langford of the Chicago Natural History Museum.

First, clean the specimen. Using steel points remove the white kaolin that sometimes occurs on fossils. Next paint the fossil with a solution of yellow dextrine, taking care not to touch the matrix. When this dries the fossil will appear much darker than the surrounding matrix and details, such as veination, will stand out. The yellow dextrine solution is prepared by dissolving one part powdered dextrine to six parts hot water. If the solution is thin, apply two or three coats. When the specimen needs cleaning, or the solution is too thick or runs onto the matrix, the dextrine can be washed off with water.

Langford warns never to apply a solution of shellac or varnish to a fossil for it gives a messy appearance and can ruin a specimen permanently after it dries.—Saint Louis Mineral and Gem Society's *Rock Lore*

New officers of the Rawlins, Wyoming, Mineral and Gem Club are Chris Larsen, president; Ned Cross, vice president; Mrs. Ned Cross, secretary-treasurer; Mrs. Effie Jaramillo, corresponding secretary; Cleo East, historian; Mrs. Bernice East, field trip director. The club is currently conducting lapidary classes for new members.

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HAVE REAL FUN with desert gems, minerals and rocks. The rockhound's how-to-do-it magazine tells how. One year (12 issues) only \$3.00. Sample 25¢. Gems and Minerals, Dept. J10, Palmdale, California.

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VISIT GOLD Pan Rock Shop. Beautiful sphere material, gems, mineral specimens, choice crystals, gem materials, jewelry, baroques, etc. Over 100 tons of material to select from. John and Etta James, proprietors. 2020 N. Carson Street, Carson City, Nevada.

U. S. GEM Quality Desert Roses (chaledony) $\frac{1}{2}$ " to 2"—cabinet specimens or cutting material. All beautiful—no "duds" — at \$2 per lb. (state size), 3 lbs. \$5.00, postage, please. C. Earl Napier, 20472 Harvard Ave., Hayward, California.

CRYSTAL CAVERN novelties—Jewelry—natural quartz crystals, silver mounted, sold at Sinnock's Furniture Store, East Blythe; and at North Palms Cafe, California (3 miles west of Desert Center), also Rock House 4 miles further west.

McSHAN'S GEM SHOP—open 5 to 9 p.m. except Mondays and Thursdays. Rocks, gems, cholla cactus wood. Mile west on U.S. 66, Needles, California, Box 22.

COLLECTORS ATTENTION! A dollar deposit brings you a brilliant approval selection of assorted polished choice cabinet sized agates. Pay for what you keep. Rare Priday Plume and Moss Nodules from the old beds of 30 years ago, \$3 per lb. in mixed lots of 5, 10 and 20 lbs. plus postage. Helena Jones, 15420 Southeast Division, Portland 66, Oregon.

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BEAUTIFUL FREE gold—Specimens \$1.00 each. Return if not satisfied. Prices to dealers, J. N. Reed, Box 102, Cabazon, California.

SAVE BATTERY costs! Run mineral light from your car cigar lighter socket. Only \$12.50 postpaid. Also operates your electric shaver. Glowpar Company, Box 8721, Los Angeles 8, California.

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QUARTZ GOLD specimens. Approximately 1-inch size, 50¢; 2-inch, \$1; 3-inch, \$2; 4 to 5 inch, \$5. Return in 10 days if not satisfied for refund. Tom Chapman, P. O. Box 392, Bakersfield, California.

TUMBLE POLISHED gems. Good variety of material, colors and sizes. 100 approximately 1 pound, \$4.40, tax included. Sent on approval. Pay for what you want only. Please send 25¢ for packaging and postage. Western Minerals, Box 61, Boulder City, Nevada.

ENGLISH MADE mahogany chest, 20 shallow drawers, show case above. Perfect condition. \$150. Bernard, Box 972, Santa Cruz, California.

CRUST DIFFERENTIATES METEORITES FROM STONES

The first meteorite seen to fall in the United States at Weston, Connecticut, in 1807, was reported by two Yale professors, Benjamin Silliman and J. L. Kingby. Of this report Thomas Jefferson, it is said, remarked that it was easier to believe that two Yale professors would lie than that stones should fall from heaven.

Some years later, however, it was finally accepted by most people that meteorites actually came from outer space.

Most meteorites are not made up of iron as is commonly believed. In fact, 93 percent of all those known are composed of stone, not dissimilar to many earthy rocks in appearance except for their thin brown crust of fused stone—the result of heating as the meteorites sped through the atmosphere.

Most minerals in meteorites are the same as those found in terrestrial rocks, including nickel, iron, diamond, graphite, magnetite, quartz, olivine, pyropene and feldspar. But, some rare minerals never found on earth are known only in meteorites, such as cohenite and schreiberite.—San Diego, California, Lapidary Society's *Shop Notes and News*

ROYAL BLUE turquoise from Nevada, \$8 per pound. Sample ounce \$1. Roy Sadler, Clayton, New Mexico.

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FOR SALE: Rock collection, saw and polisher. Stamp collection and antiques. Formerly, the RockSmiths. Applegate, Oregon, up Thompson Creek 6 miles. Iva B. Smith.

FACETING NOT FOR AVERAGE ROCKHOUND, ZOLLARS SAYS

There is a great challenge to a rockhound in producing a beautiful faceted gem and many have accepted this challenge and conquered the obstacles with commendable perseverance. But the ordinary rockhound, with the average income and with no sales or commercialism involved, will find the purchasing of expensive facet-cutting equipment, the spending of many hours in learning how to do this skilled work with the consequent procuring of good faceting material impracticable, believes H. L. Zollars of the El Paso, Texas, Mineral and Gem Society.

After the first gems are produced from inexpensive quartz and like material, most of which are presented to friends and relatives, the great urge comes to use better and more expensive material, which is often done, with the result that soon the faceter finds himself possessed with a number of lovely gems which he cannot use, does not sell and cannot afford to give away. There have been many instances in which a beginner in the rockhound hobby started at the top and became a faceter but in a few months or years realized the mistake and is now finding more enjoyment in producing less valuable gems with a much smaller investment, Zollars said.

Most any faceter in this country cannot compete on the open market with those of foreign countries where the pay scale is not nearly as high, thus there is little encouragement to follow the business as a money-making project. Even for those who have constructed their own equipment and learned to use it with all of its defects, faceting soon loses its original enchantment and the hobbyist turns to other endeavors, he concluded.—*The Voice*

LAPIDARY TIPS . . .

Hilda Chance makes these lapidary suggestions:

A polishing wheel covered with wool Axminster rug is excellent for unakite, rhodochrosite, sodalite and the feldspar family of minerals.

Make a paste of silicate of soda and talcum powder for dipping opal and any other stone that cannot stand heat. Also dip turquoise this way. Soaking the stone in water will remove the dip.

Organdy material will sometimes put a polish on turquoise that does not respond to felt or rug polishers.—*Gems and Minerals*

California Federation Plans Convention - Show in Fresno

The Fresno Gem and Mineral Society will be host to the 17th Annual Convention of the California Federation of Mineralogical Societies on June 22-24. The event will take place in the new air-conditioned Armory Building at the Fresno District Fairgrounds.

Sara K. Smerud, secretary of the 1956 Federation Show, announced that there will be adequate free parking for the many people expected at the combined convention-show. Home-cooked food will be available at nominal cost and unlimited free camping and trailer sites at Kearney Park await visitors, she added. The city also has a wide range of hotel-motel accommodations.

Fresno county is celebrating its Centen-

nial this year and the Federation's show will follow that theme, "Centennial Days." Informal dress of blue jeans and gingham will be in order.

Post-convention field trips are scheduled for June 25, 26 and 27 to the Greenhorn Mountains in Kern County.

The Rocky Mountain Federation has scheduled its annual convention and show for Rapid City, South Dakota, on June 14-16.—*The Voice*

Wyoming State Mineral and Gem Societies will hold their convention and show at Laramie on June 8-10. Field trips are planned, according to President W. Crout.—*The Voice*

New officers recently installed by the Shawnee Geology and Rockhound Club of Topeka, Kansas, were George Dauzenroth, president; Delbert Cross, vice president; Evelyn Gifford, secretary; and Mrs. Homer Herrick, treasurer.

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T. Wilson—Coalinga, California

"I do not see how you expect to sell books when you put so much technical information in your catalogs on how to pursue one's hobbies."

C. W. Stimson—Seattle, Wash.

ILLUSTRATIONS IN COLOR

Many of the pages will be in color. There will be many wonderful articles which have never been in print before. Typical of such articles will be one by the director of research for Linde Air Products Co. on how SYNTHETIC STAR RUBIES are manufactured.

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FOUR FACTORS DETERMINE LIFE OF DIAMOND BLADE

Four vital factors effect the life of a diamond saw and cause an unwarranted slippage of the grains: method of presenting work to the saw; lubrication; pressure; speed.

There are several methods of presenting work to the saw. The most widely used today is the sliding carriage, a very satisfactory way when the unit is well made, but a constant source of trouble from poorly made equipment. Perfect alignment between saw and carriage rods is a must. Too small and loose carriage bearings will make

the fastest diamond saw cut slowly. Most saw manufacturers overlook a very important factor by leaving no play in the saw mandrel. This means a cut started out of line causes binding as the saw cuts deeper into the stone. This puts a dish into the saw which means a loss of 15 to 20 percent of the saw life.

Diamond saws are made from soft cold roll steel and at best it is hard to keep them running true. Lack of lubrication causes the saw to heat, which, in turn, causes "flopping" which sometimes tears the work from the carriage and completely ruins the saw.

There is a great variation in equipment as to the proper pressure for weight pull units. Too much weight causes the saw to bend. The hydraulic retardant weight pull is recommended for greatest saw blade life. With the hydraulic retardant the pressure exerted against the saw can never exceed that of the weight pull.

With the average semi-precious gem stones, the most satisfactory speed is around 3000 surface feet per minute and it is very important that the lapidary starts his cuts straight. The greatest damage to the diamond saw takes place while starting and finishing cuts. — Fred S. Young in *The Mineralogist*

• • •

MANY MINERALS, GEM STONES CONTAIN TITANIUM METALS

Titanium is the third most abundant metal in Nature, but at the high temperatures at which rocks are formed, it is so active chemically that it is never found except in compounds in its natural state. A number of minerals containing titanium are fairly common, among them ilmenite, rutile, titanite, perovskite, octahedrite and brookite. It is often found as an impurity in magnetite. Gems that contain titanium are sphene, rutile, benitoite and euxenite.

Because at melting temperatures titanium reacts readily with almost any material a crucible can be made of, it has been a difficult metal to refine and has only been available in its metallic form in the past few years. It is the strongest metal for its weight in use. — *The Sooner Rockologist*

• • •

The North Lincoln Agate Society will hold its 14th Annual Agate Show in the Deloke, Oregon, School on Highway 101, on July 29-30.

NEW RULES ANNOUNCED FOR JADE COVE ENTRY

The military announced that collecting regulations at the Hunter Liggett Military Reservation's Jade Cove have been changed. Deputy Post Commander Harry A. Welsch writes from Jolon, California, that two large signs are being erected on the highway near Jade Cove announcing the regulations for entering the area. Military Police, Col. Welsch said, will make spot checks from time to time to make sure that posted regulations are being complied with. Written permission to enter the area was required in the past.

The requirements are:

No explosives or winches will be used for removing jade;

Jade will not be taken in large quantities. This field is open to give rockhounds a chance to get samples of jade and not for the benefit of dealers who collect this type of material for sale;

Visitors will use the two stiles when traveling to the beach from the highway. This will prevent damage to fences which has occurred in the past;

Visitors will not harass the cattle nor trample planted grain in this area. The land has been leased for farming and grazing;

Visitors will not build fires nor camp in this area.

DESERT QUIZ ANSWERS

Questions are on page 8

- 1—Tire chains generally are worse than useless in soft dry sand.
- 2—Flasks.
- 3—Open pit copper mining.
- 4—Escarpment.
- 5—Fremont River.
- 6—Gallup.
- 7—Never again tell the truth.
- 8—Apache Indian.
- 9—Creamy white.
- 10—Little Colorado River.
- 11—Trek across Death Valley.
- 12—Nevada.
- 13—Topaz.
- 14—South.
- 15—Tucson.
- 16—Mormon settlers.
- 17—Grass.
- 18—Meteorites.
- 19—Nevada.
- 20—Panamint Mountains.

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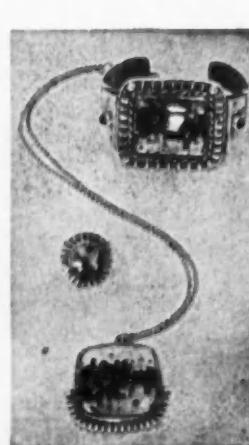
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NORTHWESTERN SOCIETIES ANNOUNCE SHOW DATES

Show dates have been told by the following organizations: June 1-3, Hell's Canyon Gem Club, Lewiston, Idaho; June 2-3, Spring Pow Wow No. 2 of the All Rockhounds of America, Inc., at Medford Oregon; June 9-10, Umpqua Mineral Club's Southern Oregon Gem and Mineral Show, Roseburg, Oregon; June 22-24, Second annual show of the Gem County Rock and Mineral Society, Emmett, Idaho; June 23-24, Magic Valley Gem Club's fifth annual show, Gooding, Idaho; June 30-July 1, second annual show of the Paradise, California, Gem and Mineral Club; June 30-July 1, All Rockhounds of America, Inc., Pow Wow at the Fairgrounds in Ellensburg, Washington; July 7-8, Prineville, Oregon, Mineral Society.

DIAMONDS ARE HARDEST SUBSTANCE ON EARTH

The diamond is a precious gem with a hardness on Mohs' scale of 10—the hardest substance known to man and the only gemstone composed of a single pure element, carbon.

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The value of a diamond is determined by its color, perfection and cutting shape. The ideal color is white with a blue tint. The slightest tinge of yellow or brown makes them less desirable but rare diamonds of green, pink, blue, red, violet and black are priceless.—Lockheed Employees' Rockcrafters

Arthur L. Flagg, co-founder and 20-year active member of the Mineralogical Society of Arizona, was recently honored by that organization. In Flagg's honor, the society established a perpetual award to be presented each year to the Arizona school that enters the most outstanding exhibit of miniature cabinet specimens at the State Fair.

July 14-15 are the dates for the first annual gem and mineral show with commercial dealers of the Reno, Nevada, Washoe Gem and Mineral Society. The show is scheduled to take place at the California Building, Idlewild Park, Reno, and society president Richard C. Frey announced that field trips are planned.

The South Bay Lapidary and Mineral Society of Hermosa Beach, California, has set September 15-16 as the dates for its show, scheduled to take place at Clark Stadium.

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The Redwood Gem and Mineral Society of Santa Rosa, California, will present its annual show in conjunction with the Sonoma County Fair, July 20-28. Club officers are Leo Connolly, president; Mrs. Roy Dutro, vice president; Hazel Sewell, secretary; and Lottie Miller, treasurer.

Members of the Santa Fe, New Mexico, Gem and Mineral Club elected Walter Wright president for the coming club year. Other officers elected were W. Burton Lewis, vice president; Joe Lawler, secretary; Pat Insley, treasurer; and Hilda C. Voetberg, corresponding secretary.

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Ancient Chinese Lapidaries Spent Years Carving Single Jade Pieces

By CARROLL KELLEY

During the late Chou period—600 to 200 B.C.—Chinese lapidaries produced carved jade pieces which, for excellence of workmanship, were not to be surpassed for 2000 years. The work was done with the most primitive and simplest of tools. Modern abrasives have supplanted some of the less effective ones formerly used, but in other

respects the art of carving jade has changed but little.

The carving of a jade object was rarely the work of one artisan. In China, Jade carving has for centuries been an important industry, and the work was specialized.

The most important man in the production of a carved jade piece was the master carver. Not only did he perform the most difficult phases of the work, but he alone had the privilege of deciding what object should be made from a given piece of jade. With this end in view he subjected the rough stone to a long and careful examination, taking into account size, shape and color patterns. His decision, when made, was final. No sketches were required, the design and all details regarding the finished piece were kept in the master carver's head.

Rough cutting of the block to size was done outside the shop in an area called the yard. Here two men sawed the jade by drawing a knife-edged iron affair back and forth across the work while a boy fed abrasive such as quartz sand into the cut.

The master cutter next marked a rough outline of the object to be made. If the inside was to be hollowed out this was done before any further work on the outside. The hollowing out was accomplished by means of a tubular iron drill mounted in a crude wooden spindle which was given a reciprocal motion by a leather belt fastened to a pair of foot treadles. Various abrasives were used: garnet, quartz, corundum, ruby, diamond—whatever was available. These were crushed to varying degrees of fineness depending on the type of work at hand. Sometimes a paste was made by mixing an abrasive with bone-meal, dried blood or pork fat.

The core from the drilling was broken out and the bottom of the hole roughly finished by grinding with metal tools charged with abrasive.

Next the master cutter, guided by the lay-out lines, removed as much surplus material as he could with the circular saw. While two assistants held the work, the

master cutter worked the foot treadles of the lathe and fed the abrasive.

The jade then went to the master carver who carried the rough forming still further by cutting many small circular rings into the work with tubular drills. This operation required the highest degree of skill—a slight chip or fracture in the wrong place, and the piece was ruined.

It was now necessary to clean and smooth the rough projections left by the chisels and drills. This was done by grinding these edges with a wheel or ring made of wood or iron and charged with an abrasive called "dragon teeth," a mixture of coarsely ground abrasive and horse fat.

If the design required undercutting so as to bring certain portions into relief, this was done in the lathe using iron cutting tools shaped like a nail—the "head" of the tool making the undercut. Fretwork and other small openings in the design were made with a bow drill. First a tiny hole was drilled into each angle of a projected opening, and then the remaining web of material was removed by threading a small charged wire into one of the holes and sawing out the slug. Objects such as incense burners often had hundreds of such openings.

By now several years of patient labor had gone into the piece, and almost as many years remained before it would be finished. For the next step, polishing, was one which the Chinese lapidary considered to be of the highest importance. The "feel" of the finished piece depended on how well the artisan did this job, and time and labor were not spared.

The master carver, sitting at his treadle lathe and using tools with ball shaped heads charged with diamond dust, would give the entire surface a thorough "burnishing" to remove all traces of the saws, drills, chisels and gouges. According to some ancient accounts, a full year might be required to perform this one operation.

Satisfied, at last, that the piece was properly prepared, the carver began the first actual polishing. This was done in the lathe, using wooden or leather tools of every size and shape necessary to reach all surfaces of the carving. Finely ground ruby crystals were used for this "rough" polishing. The final polishing was done with leather wheels charged with pulverized bamboo chips.

Some of the finest carved jade in America is in the collection of the Walker Art Center and the Minneapolis Institute of Arts, both located in Minneapolis, Minnesota. Visitors and exhibitors at the 9th Annual National Convention of the American and the Midwest Federations of Mineralogical Societies, July 12-15 will see these outstanding jades in Minneapolis.

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AMATEUR GEM CUTTER

By DR. H. C. DAKE, Editor of The Mineralogist

Bracelets for wrist wear, cut from various semi-precious gem minerals can be worked by various lapidary methods. Perhaps the method used by the Chinese lapidarian is the most simple and effective. The Chinese often produce splendid bracelets from jade and nephrite. In selecting a gem material for bracelet cutting, the mineral should be tough, free of fractures, flaws and cleavage. A gem mineral with a marked cleavage would be wholly unsuited to withstand wear as a bracelet, or even a finger ring.

In working valuable jade, the Chinese have learned various methods of conserving the rough material. In hollowing out a vase, cup or bowl, the Chinese artisan will first cut a small core to the proper depth. This core is sunk by tube drilling and then broken out with a sharp blow from a hammer. The core can, of course, be used for cabochons or any other suitable ornament. After the central core has been removed, a larger size tube is used to take out a hollow cylinder of the desired diameter. In order to avoid breakage when taking out the cylinder, same should be undercut, working in the space left by the original core. The undercut can be made by the use of small and tin-mounted silicon carbide wheels, on a hand grinder.

A block of rough gem material will also suffice for obtaining hollow cylinders of various sizes suitable for rings and bracelets. The same technique as described above can be applied, first removing a central core.

Tube drilling can be carried out by various methods, the power drill press being the most convenient and effective. The Chinese use ordinary iron pipe of various diameters, and as an abrasive coarse silicon carbide grit serves as the cutting agent. Copper and brass tubing is also excellent. Diamond dust (bort) of about 120 grit is the fastest cutting agent for use in tube drilling.

In order to cut clearance the tube used for drilling should be slightly flanged on the working face. This can be done by gently tapping with a hammer. With large heavy tubes, a chisel can be used to cut notches on the working face, and a flange bent down by hammering. The notches will also serve to better hold the abrasive where the cutting is being done.

Plenty of lubricant should be applied at the working point. In drilling very small holes, light oil is mixed with the abrasive grit. For very large holes, water is a satisfactory lubricant.

After a cross section has been cut from the cylinder, it is necessary to round off the edges by grinding on the silicon carbide wheels. Holding the work by hand is unsatisfactory as it will be found difficult to keep the bracelet the same diameter throughout. If cut too deeply on one area it will be necessary to reduce the entire surface to this same diameter.

In grinding a bracelet (or finger ring) the Chinese does not attempt to hold the

work against the grinding wheel. The work is revolved against the wheel and by this method it is not at all difficult to produce a symmetrical piece of work. A method whereby the grinding wheel revolves in one direction and the work in the opposite direction would be ideal.

After the blank cut from hollow cylinder has been properly shaped by grinding, the deep scratches should be removed by the usual sanding operation. The inner surface of the bracelet or ring can be sanded by the use of various size felt cones, and small felt wheels, using fine grit (220 or finer) silicon carbide or *Norbite*.

Final polishing is carried out on the regular felt buffs, holding the work by hand. The inner surfaces can be reached by small felt polishing wheels or cone-shaped polishing wheels. A cone-shaped polisher can be made by cementing felt or soft leather to a cone-shaped piece of wood.

Small felt buffs and cones are available from supply houses. These are intended to be used on small polishing motors and hand grinders. The regular polishing agents are indicated in this work.

There are a number of gem minerals other than jade and nephrite which can be worked into bracelets and rings. Agate, free of flaws and fractures, can be utilized as this material lacks cleavage and is quite tough and tenacious. Some of the hard, tough, and compact varieties of massive garnet (grossularite), are well adapted for these ornaments. Other gem minerals will suggest themselves as being suitable.

In cutting a hollow cylinder for a bracelet due care and attention should be given to the final size to slip over the hand. The size of a finger ring can be enlarged, by grinding on the inner surface, if there is enough material to permit same without breakage of ring. This can be done with

small grinding wheels and buffs, mounted on a small mandrel, and held in a hand grinder.

Hand grinders are available from various lapidary supply houses, and are available in several styles. One type is powered by a very small electric motor contained within the unit. Another style hand grinder has a flexible shaft which can be attached to the armature shaft of a small electric motor. Grinders of this kind find wide use in the home jewelry and lapidary shop.

* * *

Owing to its porous nature, tiger eye or crocidolite may be readily colored by soaking in various dyes, usually aniline dyes are used. To facilitate the penetration of the coloring solution, same may be heated from time to time. The time for coloring will vary some with the porosity of the gem.

The gem is often colored a pale green or dull yellow to simulate the chrysoberyl cat's eye. The stones are usually placed in the beauty bath after the cabochon has received its final polish.

* * *

The gem material lapis lazuli may carry admixtures of calcite in the matrix. These areas being soft will tend to under cut and to "polish out." This fact may account for the difficulty in obtaining a uniform and even polish on some lapis.

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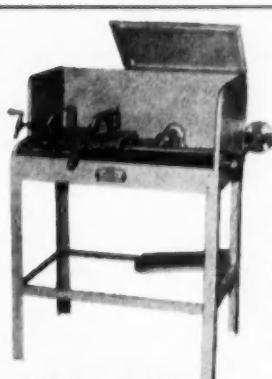
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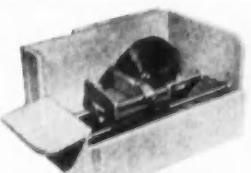


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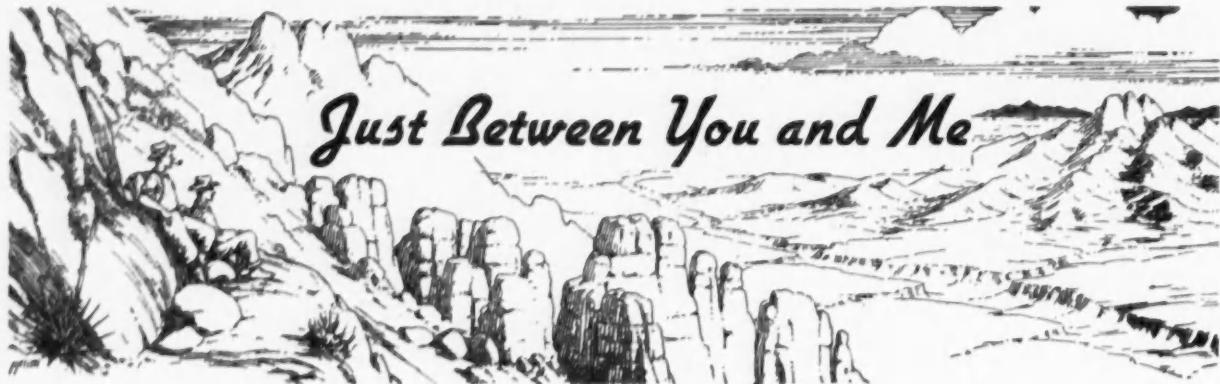
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Just Between You and Me

By RANDALL HENDERSON

RECENTLY I SPREAD my sleeping bag on the high plateau of the Sierra Juarez in Baja California beneath some of those "four-leaf" pinyons which Dr. Edmund Jaeger wrote about in the April issue of *Desert Magazine*. With four companions I was on a three-day backpack trip in a desert wilderness so precipitous we frequently had to resort to the use of our ropes.

That evening, and during the strenuous days which followed, my mind kept reverting to a passage in *The Desert Year* written by Joseph Wood Krutch. The author suggested that "the way of the desert and the way of the jungle represent two opposite methods of reaching stability at two extremes of density.

"In the jungle there is plenty of everything life needs except space. . . . Everything is on top of everything else; there is no cranny which is not both occupied and disputed. At every moment, war to the death rages fiercely.

"In the desert, on the other hand, it is the environment itself which is the limiting factor. To some extent the struggle of creature against creature is mitigated, although it is of course not abolished even in the vegetable kingdom. For the plant which in the one place would be strangled to death by its neighbor dies a thirsty seedling in the desert because that same neighbor has drawn the scant moisture from the spot of earth out of which it was attempting to spring.

"Sometimes it seems to me that, of the two methods, the desert's is the kindlier . . . I wonder if it does not augur ill for the human race that its techniques have enabled it to produce for itself a sort of artificial, technological jungle in which too many people can live somehow—if not well—and where, therefore, as in the jungle, the struggle inevitably becomes ultimately the struggle of man against man and not the struggle of man against Nature."

Dr. Krutch might have gone further and pointed out that the most effective limiting factor on the desert is a sort of birth control. Prodigious numbers of seeds are produced by the various species—but due to factors which are essentially of the desert environment only a few of them germinate.

This would seem to bear out Dr. Krutch's conclusion that as between desert and jungle, the desert method is the kindlier.

Perhaps the human family sooner or later will have to decide whether it will pursue the way of the desert or the way of the jungle.

* * *

The U. S. Navy is encountering stormy seas in its efforts to acquire another 3,100,000 acres of Nevada land

in addition to the millions it already has appropriated in southwestern states for aerial gunnery and bombing purposes.

The latest Navy grab is in the Black Rock-Sahwave country of northwestern Nevada where application was made to withdraw 2,800,000 acres of the public domain in addition to the purchase of 300,000 acres of range and mining lands from private owners.

Nevadans are not going to give up their land without a struggle. The Air Force and Atomic Energy Commission already have taken 3,360,000 acres from the state for target purposes and atomic tests, and Nevada ranchers and mining men feel that the admirals are asking too much of them.

The Air Force offered to let the Navy use 1,000,000 acres of the Tonopah Range—but so far, the Navy has ignored the offer.

You may wonder why it would not be possible for the Army and Navy and Air Force to coordinate their training and testing activities under a unified command—as they will have to do if a war comes. I think I know the answer to that one. A unified command means just that—with a single commander in charge of the over-all operation. He would be either an admiral or a general. Can you imagine a general taking orders from an admiral, or vice versa? That is the way it would have to work in a unified command. And to the royal braid and brass of the Pentagon that is unthinkable. I know how it works. I was an officer in two wars.

* * *

Fifty years ago Gordon Stuart was a mule-skinner in Imperial Valley, California. He was leveling sand dunes down there when the Colorado broke through in 1905 and formed Salton Sea. More recently he has retired and his hobby is a little pamphlet called Pacific Palisades Press which he prints occasionally in his garage.

He wrote: "Forty years ago down on the desert we built flat-roofed box houses for utility only. We built them out of plain boards and only hoped for shelter from the sun, wind and sand.

"We received no publicity, no one praised our skill or called us masters of our art. We were not proud of our houses. We called them shacks. Today we wonder. Were we 40 years ahead of our time in designing? Last week an architect got a prize for designing a house just like our desert shacks. We will sue him. No, we can't sue him for stealing our design. We stole the design from a man who built hen houses."

BOOKS of the SOUTHWEST

HOPI INDIANS CLING TO THEIR ANCIENT TRADITIONS

When Father Francisco Garces, intrepid padre of the desert trails, visited the Hopi villages in 1776, the Indians would have nothing to do with him. He camped in the pueblo plaza for two days, and being made aware that he was an unwelcome visitor, departed in sorrow.

Father Garces was not the first, nor the last of the missionaries who sought without success to penetrate the barrier of silent aloofness with which the peace-loving tribesmen of the Hopi mesas greeted all aliens who would undermine their ancient religious beliefs.

Conquistador and priest, explorer, soldier, missionary, trader, scientist and tourist—all have climbed the rocky trails to the top of the Hopi mesas, and with few exceptions have been treated courteously, for the Hopi are by cultural pattern a hospitable, charming and witty people—but always the Indians have turned back to their traditional way of life.

Harry C. James was one of those who by his gracious manner and sincerity, broke through the reserve and after visits to their rocky citadels was received as friend and brother. Eventually he was adopted into the tribe in recognition of his help in correcting some of the injustices to which the Hopis had been subjected during a period when the character of these people was little understood by the federal Indian Bureau.

Out of his long acquaintance with the Hopis, James has written one of the most understanding and informative books yet to be devoted to these strange tribesmen of northern Arizona, *The Hopi Indians*.

Most Americans know the Hopis as men who dance with snakes in their mouths, but the Snake ceremonial merely is one aspect of a deeply religious people who at heart are gentle and simple in manner, and devoted to the traditions of their fore-fathers.

Art sketches by Don Perceval and many photographs give added interest to the book. Published by Caxton Printers, Caldwell, Idaho. 236 pages. \$5.00.

Books reviewed on this page are available at Desert Crafts Shop, Palm Desert. Add three percent sales tax on orders to be sent to California.

CLOSE-TO-HOME ADVENTURES OF ERLE STANLEY GARDNER

"People who go to South America or Australia in search of the unusual seldom realize that for a fraction of the cost they could find frontiers which are far more exciting almost in their own back yard."

This is Erle Stanley Gardner's summation of the philosophy behind his travel adventure, *Neighborhood Frontiers*. These frontiers include our own Desert Southwest, the Puget Sound country and Mexico's Yucatan Peninsula, Yaqui River and Barranca country.

Everywhere the author goes he finds adventure. Not because he is a famous writer whose work demands new experience and hazard, but because he is a sympathetic traveler with a real interest in people. He takes time out to meet them, he is genuinely interested in what they have to say, in how they live, in their crafts and accomplishments.

This book is rewarding in two ways. First, the author's adventures make interesting reading; second, the reader is made aware of how simple it really is to find adventure in one's own back yard.

Published by William Morrow & Company, Inc., New York; 272 pages, 64 pages of illustrations; \$5.00.

FIELD GUIDE TO ARIZONA SO. CALIFORNIA DESERT

Jay Ellis Ransom, who has had over a dozen of his gem and mineral field trip feature stories published in *Desert Magazine*, has written a book well worth the attention of gem hunters, mineral collectors and uranium hunters in the Southwest.

Arizona Gem Trails and the Colorado Desert of California is a field guide that not only presents logged trips to the smallest detail, but brings in local history, colorful residents—especially those who enjoy the company of rockhounds—and other comments by the author which make the book as valuable, interesting and varied as rock collecting itself.

Ransom knows the area and is qualified to lead you into it via his field guide.

Published by Mineralogist Publishing Company, 329 S.E. 32nd Avenue, Portland 15, Oregon; paperbound; illustrated; 96 pages. \$2.00.

• • • Imperial Valley History . . .

Otis B. Tout, who in 1931 published a history of Imperial Valley, California, titled *The First Thirty Years*, has announced that he is now working on an enlarged volume, *The First Fifty-Five Years* of Imperial Valley's history. The book will date from 1901, the year when Colorado River water was first brought to the Imperial basin, until the present. The date of publication has not yet been announced.



THREE OUTSTANDING BOOKS on BIRDS

You will want to own . . .

AUDUBON'S BIRDS OF AMERICA—Popular Edition. The best of the famous naturalist's paintings—288 full pages, 4-color plates. Text by Ludlow Griscom, chairman of the Board of the National Audubon Society. 320 pages. \$2.95

A FIELD GUIDE TO WESTERN BIRDS—By Roger Tory Peterson. Practical Guide to the outdoor identification of birds regularly found west of the Rockies. 740 illustrations, many in full color. Diagrammatic Drawings. 240 pages. \$3.75

SONGBIRDS IN YOUR GARDEN—By John K. Terres. A treasury of information about making friends with the birds. Covers all species of small birds in U. S. Tells how to attract and welcome songsters. Illustrations, diagrams. 274 pages. \$3.95

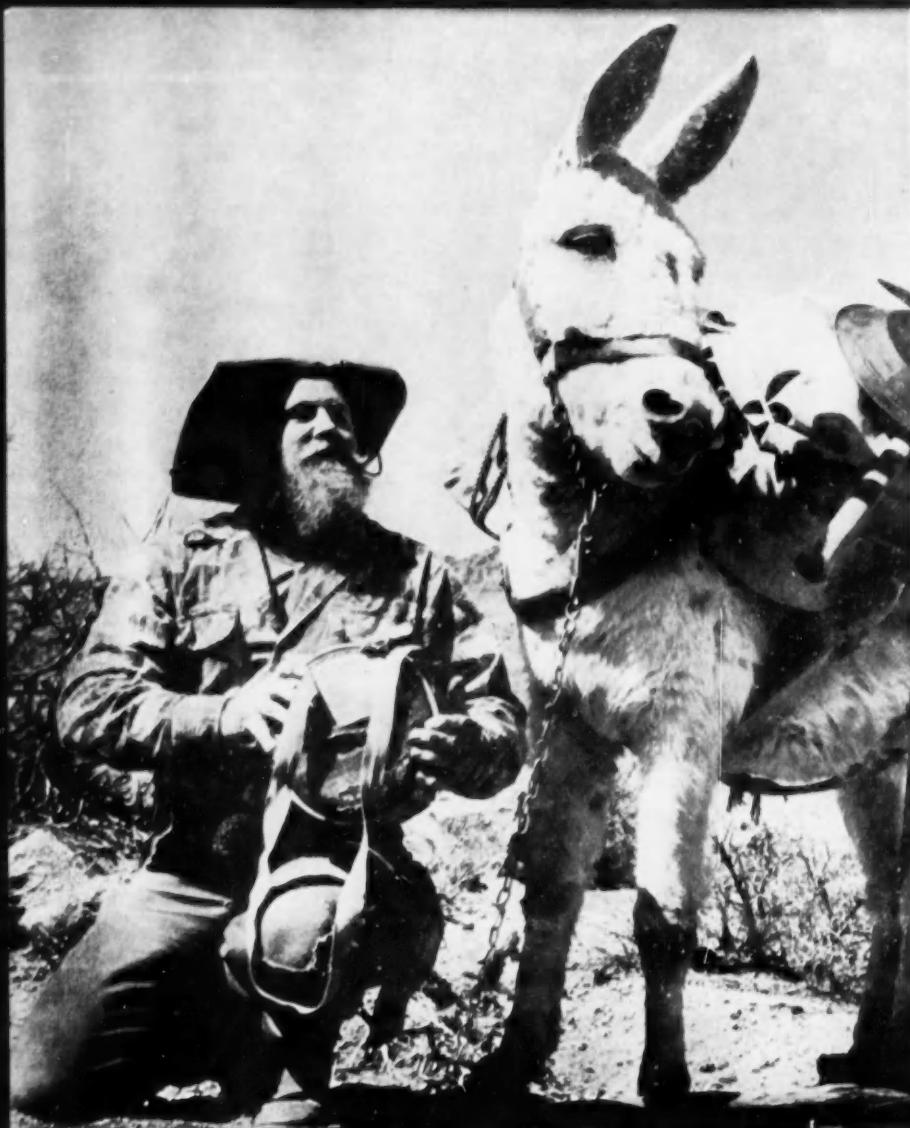
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PALM DESERT

CALIFORNIA





Bad Water Bill

Adrian Atwater of Carson City, Nevada, wins first prize in this month's contest with this photograph of Bad Water Bill and his mule, Gravel Gertie. Picture was taken with a 4x5 Speed Graphic, Tri-X film, 1/50 second at f. 32.

Pictures of the Month

Horned Lizard

This studio photograph of an Arizona Horned Lizard won Richard A. Slater of Phoenix, Arizona, second prize in the contest. Slater used a 4x5 Speed Graphic, 127 mm. Ektar F/4.7 lens, Kodak Tri-X film, 1/400 at f. 32 with flash.

